Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 55, No 3, MARCH 1987

- An Introduction to AX.25 Protocol
- Antarctic Communications
- Troubleshooting Tips
- EME in the USSR
- Eddystone 770R
- No Fuss PCBs

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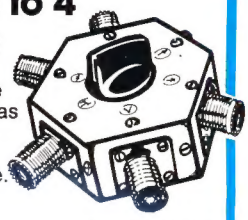

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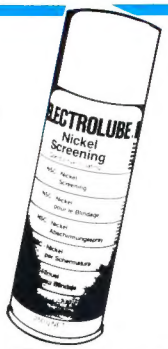

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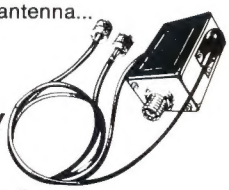

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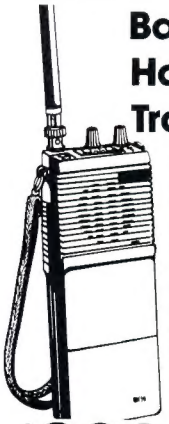

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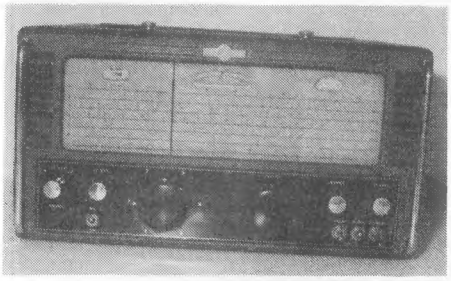
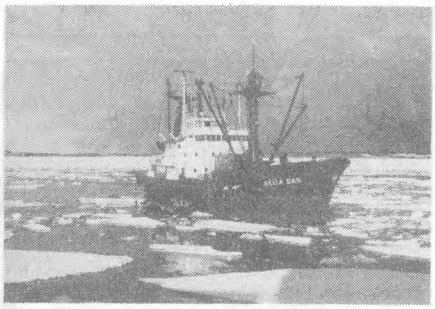
Amateur Radio

Special Features

Antarctic Communications *by Bert Trupp VK5BVN* 3



Classic Communications Equipment *Eddystone 770R by Colin MacKinnon VK2DYM* 16
Six Metres — *the band of milk and honey by Arnie Katarzynski VK4FXZ* 20
Spot the Oblast *by Barry Clarke VK5BS* 18
Status Report of EME in the USSR ... 21
WIA Video Tape Listing 38

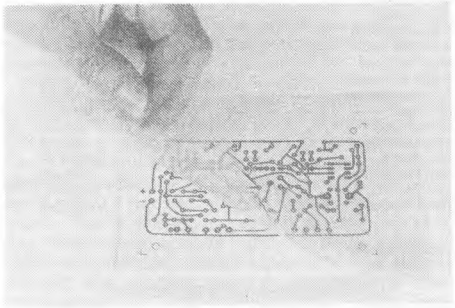


The Antarctic resupply vessel, *Nella Dan* anchored off the Vestfold Hills, near Davis Station.

Technical Features

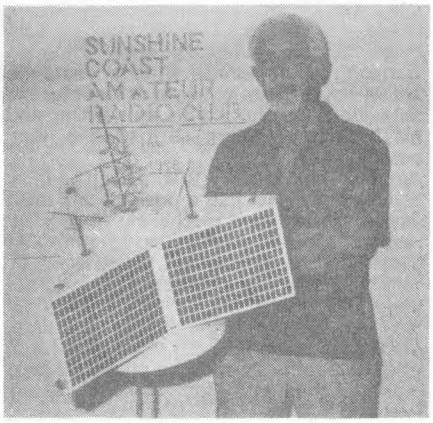
An Introduction to AX.25 Link-Layer Protocol *by Gil Mays VK6AGC* 5
Feedline Data Calculations for the VZ200/300 *by Rick Buhre VK4AIM* 10

Try This
— *Communications/Music Speaker System* 35



— *No Fuss Printed Circuit Boards* 14

Regular Features

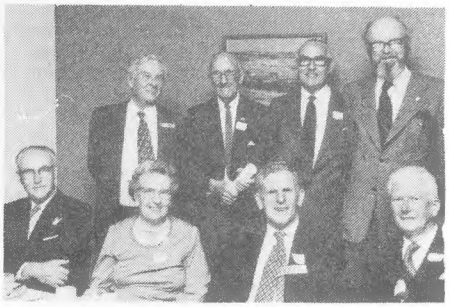


Advertisers' Index 64
ALARA 46
AMSAT Australia 43
Awards
— *City of Wagga Wagga Award* 51
— *Cornish Award* 51
— *Islamic Summit Conference Award* 51
— *Rumanian Award* 51
Club Corner 54

Ionospheric Predications 62
Novice Notes — *Some Troubleshooting Tips* 22
Obituaries — *Geoffrey Clay, Heinz Padberg, Harry Carter, Pieter Van Louwersen & Will Collis* 61
Over to you! — *members have their say* 58
Pounding Brass 36
QSP 20, 28, 47, 49, 50, 51, 53, 61, 64

Spotlight on SWLing 41
Stolen Equipment 63
Technical Mailbox 35
Thumbnail Sketches
— *Kenneth Campbell Gunn VK4LG/VK4LD* 17
— *Jack Pickles VK2YK* 62
Try This
— *Communications/Music Speaker System* 35
— *No Fuss Printed Circuit Boards* 14
VHF UHF — *an expanding world* 30
VK2 Mini Bulletin 55
VK4 WIA Notes 56

EMDRC



Club Portrait — *EMDRC* 52
Contests 40
Editor's Comment — *Mainly Nautical* 2
Education Notes — *with guest writer* 47
Electro-Magnetic Compatibility Report ... 48
Five-Eighth Wave 57
Hamads 64
How's DX 26
International News 42
Intruder Watch 37

Radio Amateur Old Timers Club 50
Silent Keys — *VK2RR, VK4KK, VK3HZ, VK2EO & VK3ACF* 61

WICEN News — *WICEN in a Nutshell* 37

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Editor's Comment

MAINLY NAUTICAL

March is here and Autumn begins, the "season of mists and mellow fruitfulness" at least in temperate zones. To your Editor and about 600 other owners of trailable sailing boats it also means the Victorian Labour Day holiday week-end and the annual Marlay Point Overnight Sailing Race.

The Marlay is an event like no other for those who "mess about in boats". Its very size, at least 600 vessels taking part, makes it unique in the world, although possibly this claim could be contested by Denmark. Six hundred boats racing in darkness is a spectacle which one has to join to appreciate. TV or photography simply cannot do justice to the fleet of little lights, red, green or white, depending on which way one looks from where! And if all these craft are drifting slowly through the narrow McLennan Strait, which joins the two main Gippsland Lakes, Wellington and Victoria, the traffic problems can be incredible. Mist or fog, yes, sometimes. Strong winds, sometimes. The 40 plus nautical miles have been traversed and the race won long before sunrise. In other years the full 24 hours is not enough, at least for the tail-enders, among whom your Editor and his hapless crew are all too often numbered!

Amateur radio mixes well with such nautical activities. At least half a dozen boats each year may be heard discussing their progress or otherwise either on 2-metre FM simplex or via the Latrobe Valley repeater. This year the new repeater at Nungurner (near Bairnsdale) will be available. Some may also use the HF bands while maritime-mobile. All boats are also required by race rules at least to monitor the official 27 MHz marine channels, for obvious safety reasons.

This leads us to the wider field of ocean cruising (usually in something a little larger than a trailer-sailer) and the use of amateur radio as the main means of communication. Many of these "blue-water yachties" find it to be an excellent medium, particularly when use is made of the various regular 20-metre nets. Some of the call signs tend to raise doubt as to whether their users are really licensed amateurs! Some are well-known to be pirates, at least in the radio sense.

A letter has been received recently from a WIA member with strong views on this topic. He accuses the Institute of being too soft with such pirates, and alleges that this magazine has publicised, rather than criticised, their activities. If this is so, and I doubt it, it has been in complete ignorance of any illegitimacy, at least while I have been Editor.

But what can be done about unlicensed operators? On land, they are within the jurisdiction of DOC and will eventually be caught. The Radiocommunications Act, partly as a result of suggestions by the WIA, contains several powerful clauses which make piracy a much greater risk and its penalties far more drastic than under the old Wireless Telegraphy Act. Legitimate operators risk their own licences by communicating with pirates, whether ashore or afloat. But . . . is that odd call sign /MM in mid-Pacific genuine or not? How can one tell? It is a little impractical for DOC to board the yacht and inspect the licence. The boat is outside DOC's territory anyway. There may be an emergency of some kind. If so, the rules are waived. So many of these situations are not black or white; but one thing is sure. The WIA does *not* condone unlicensed operation. Let any offenders take note and be warned!

Bill Rice VK3ABP
Editor

LISTEN

The ever-thoughtful and DX orientated amateur, Ian VK5QX, made an STD call just as this magazine was going to press, giving information that he had just received from Bharathi VU2RBI.

Bharathi advised Ian that the Andaman and Nicobar Islands would be activated from February 20 to March 31, this year, using the call signs VU4APR and VU4NRO. She also advised that they would operate on all bands except 160 metres, both CW and SSB.

This DXpedition to a much wanted country is being conducted under the auspices of the National Institute of Amateur radio (NIAR) and QSLs go to VU2APR.

A special announcement of a super article scheduled for next month had to be removed to make room to allow amateurs the opportunity to work this very rare country which is very high on everyone's Wanted List, since VU7ANI became a Silent Key.

Good luck to all that need this one for their DXCC score.

—de Ken VK3AH.

Cover Story —

Bert Trupp VK5BVN
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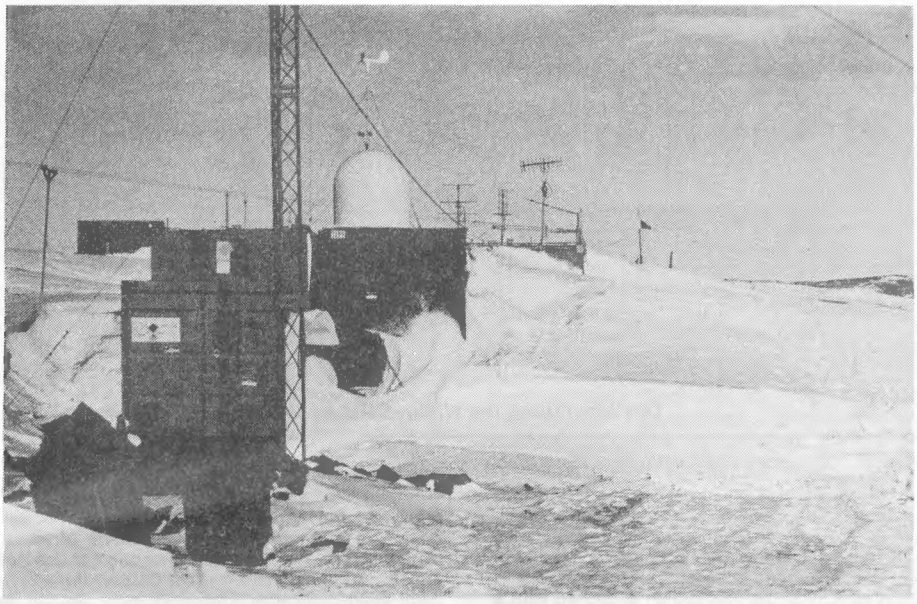
ANTARCTIC COMMUNICATIONS



Lying unspoiled at the end of the world, surrounded by storm-swept seas, the mention of Antarctica kindles thoughts of ice and adventure in nearly everyone.

Although Antarctica is expensive to reach and difficult to live on, at least 17 countries support research programs from 44 permanent stations. Data from this polar region is not just interesting, but now crucial to the understanding of Earth's basic processes. Much of this would not be possible without extensive radio communication facilities, as the sampling modes become more sophisticated and collection efforts are intensified.

Lying unspoiled at the end of the world, surrounded by storm swept seas, the mention of Antarctica kindles thoughts of ice and adventure in nearly everyone. Yet only a very few are ever lucky enough to visit this frozen continent. Each year a number of nations send forth comparatively small groups of expeditioners to continue the research work at Antarctic stations.

By September, snow has drifted up to the roofs of buildings. The INMARSAT dome can be seen mounted on the roof of the radio shack.

The Australian National Antarctic Research Expedition (ANARE) outpost in the Vestfold Hills, Davis Base, is one such station. Situated on bare rock above a sandy cove, the station is home to about 25 wintering expeditioners. Affectionately known as the *Riviera of the South,* the ice free area of the Vestfold Hills covers about 400 square-kilometres and is dotted with numerous lakes.

Sometimes described as an Antarctic oasis, the area is kept ice free by wind blowing snow away and solar warming. These areas are unique as more than 99 percent of the continent's surface is covered in ice.

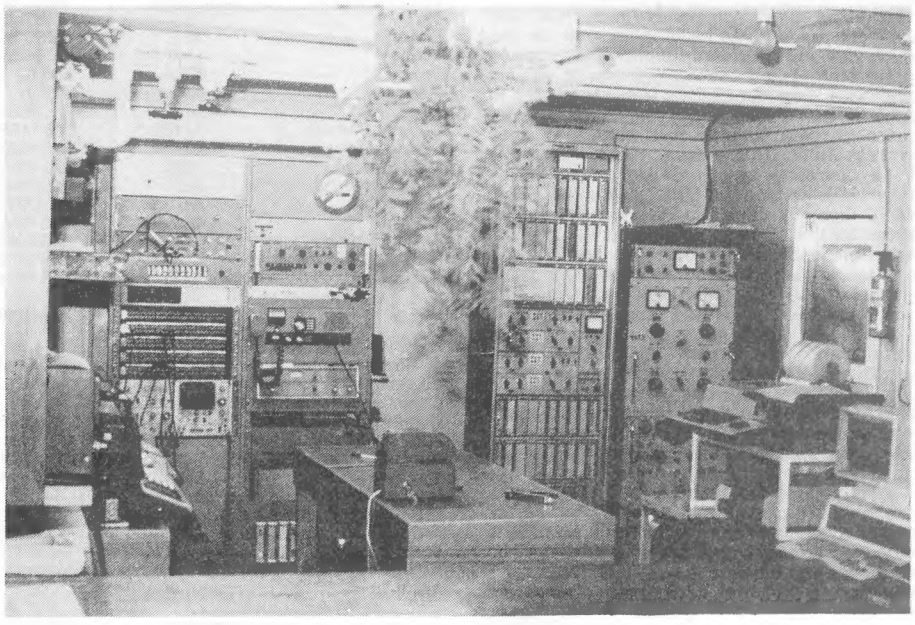
Davis was established in January 1957, as preparation for the International Geophysical Year of 1957/58. The wintering party numbered five, including a radio operator and radio supervisor. Radio activities commenced almost immediately, after the erection of four aerial masts — two Kelly and Lewis 15 metres and two wooden nine metre masts. Traffic initially consisted of one sched a day, with more scheds opening once weather traffic commenced. Radio equipment was reconditioned war surplus gear. A deal of time was spent on repair and maintenance! Power was obtained from a 15 kVA generator housed in the newly constructed engine room/workshop/bathroom.

By 1959, the equipment consisted of two AT20 transmitters, a Collins 51J-4, two Kinsley AR7 receivers and an ART-13 MF beacon. After sharing with the Meteorological Section for some years, a dedicated building was constructed to house the communications equipment. All scheds were either CW or phone and traffic was mainly meteorological observations.

The station was temporarily closed between January 1965 and February 1969, allowing concentration of the Antarctic Division's resources on the building of a replacement for Wilkes station — Casey. In 1969, an early model teleprinter was provided to receive an AAP news service. Upgrading in 1971 saw the installation of a 1 kW SSB Racal transmitter and two M-100 teleprinters. This now allowed the establishment of a Radphone (radio-telephone) service back to Australia for the expeditioners. Slowly over the years the equipment improved and traffic increased. The aerial farm was also expanded with a number of large rhombic aerials. These were erected on 22 metre steel masts guyed to withstand the occasional 100 knot winds.

A remote transmitter hut was erected in 1972 which then also housed the MF non-directional beacon (NDB). This beacon is used by the re-supply ships and visiting or over-flying aircraft. The original ART-13 was replaced by a locally made version and, in 1976, by a commercial DCA unit reconditioned after use in the Prince Charles Mountains. Newer equipment has since been provided.

For the safety of field parties working in the Vestfold Hills and on the ice plateau, radios were always carried. The very early field radios required hand cranked generators. Difficulties encountered during these field trips ranged from aerials buried in snow to forgetting the crank handle! Fortunately, the early sets were replaced by lighter battery powered 5 to 15W SSB HF units. Under evaluation today is a VHF repeater which services most of the Vestfold Hills.



The interior of the Davis Radio Station, VLZ, showing the teletype area. The pot plant is plastic!

At present, simplex and duplex HF circuits service nearly all traffic needs. Various modes of radio-teletype transmissions carry the bulk of the meteorological, administrative and private traffic.

Radphone circuits are still scheduled with OTC coast radio stations for calls to Australia and overseas. These provide expeditioners with the only direct social contact with the outside world. Privacy on the radphone circuits is encouraged wherever possible.

The installation of an INMARSAT satellite station in 1985 heralded the beginning of a new era. This now gave the station 24 hour access to international telephone and telex systems. However, its use is limited due to the high costs involved. Within the next two years, satellite communications with ANARE stations is to be upgraded with the installation of new equipment utilising INTELSAT VISTA satellite links. This will provide higher capacity telex-data transmissions, facsimile, telephone and possibly video services comparable to those presently available in Australia.

A typical day for the communications officer at Davis starts about 2330 UTC, with opening up the shack, tuning sets and warming up the Morse key. One of the Meteorological folk drop in the overnight observations (obs) in preparation for the first sched with Mawson at 2350 UTC (duplex CW).

Davis has the smallest communications section of the three Australian Antarctic stations on the continent. For much of the year traffic sent is just what is originated from the station itself. Whereas Casey normally operates a 16 hour radio watch, collecting Meteorological traffic from Dumont D'Urville and relaying all meteorological and administrative traffic for continental ANARE stations back to Australia. Mawson station operates as the main meteorological data collection centre for Greater Antarctica and hence is the busiest with a 19 hour per day radio watch.

The Davis phone, telex and CW scheds continue throughout the day ending around 1315 UTC, when the last balloon flight and meteorological observations data is sent via telex, again to Mawson. Routine message traffic is usually prepared between scheds as time permits. Main equipment today consists of Rhode and Schwarz EK-70 and Drake DSR-2 receivers and a Racal TTA-1860 1 kW main transmitter. A new Dansk S76210 1 kW transmitter will replace the old Racal TA-127 as a standby unit.

The advantage of operating from an Antarctic station is the electrically quiet bands largely free from industrial noise. However, the HF links are susceptible to vagaries of the ionosphere. Whistlers can be heard occasionally — they are a product of VLF energy generated by lightning flashes that are ducted down magnetic field lines to the poles. Blackout of HF communications, due to sudden ionospheric disturbances or magnetic storms, may last up to about five days. After a major solar flare, an event known as polar cap absorption may disrupt communications for up to 10 days. Periods of magnetic and solar activity may cause poor quality circuits for weeks creating havoc with radphone call bookings. Even when the ether is quiet, S9 static noise may be generated by wind-blown snow during blizzards. Despite this, 90-100 percent circuit success is normal for Davis, as it appears the most favourable location for HF communications of the three ANARE stations.

Of the scientific research programs underway in Antarctica, the most important to the amateur are the studies in Upper Atmospheric Physics (UAP). A kaleidoscope of geophysical phenomena is manifested as a result of direct and indirect processes occurring in the magnetosphere and the ionosphere.

Experiments monitor interaction of solar wind energy and particles in the geomagnetic field, taking advantage of Davis' unique location under the projection of the polar cusp. The beautiful, majestic auroral substorms result from high energy particles colliding with atoms and molecules causing them to emit their intense characteristic coloured lights.

Magnetic storms are recorded on fluxgate magnetometers which measure the H, D and Z components of the Earth's magnetic field. Other magnetometers measure declination, horizontal and vertical components and geomagnetic pulsations. A riometer (relative Ionospheric opacity meter) also monitors cosmic noise for measurement of ionospheric absorption. The ionospheric region directly above the station is probed with a swept frequency radar known as an ionosonde. The echoes received are recorded on 16 mm film and can identify particular regions of the ionosphere's reflections layers.

Daytime during the Winter Solstice at Davis.

In addition to the principal UAP research objectives, such observations will also form a sound basis for correlation studies with other geophysical phenomena. This may, one day, end speculation on whether the bombardment by ionised solar particles is linked with long-term changes in the weather.

For only a short period each year the isolation of wintering expeditioners is broken. Each year from about November to March the sea-ice breaks out sufficiently to allow the ice strengthened resupply ships access to the coastal stations. This summer the Antarctic Division chartered two ships, the *Icebird/DPIB* and the *Nella Dan/OZKC.*

The ships bring tonnes of food, fuel and equipment, as well as relief personnel for the coming year and additional summer scientists and support staff. Life is hectic with frantic activity everywhere. Communications traffic increases to staggering proportions. Extra scheds are required to accommodate summer field parties, logistics and ships traffic. This season, major field camps will be operating at Heard Island and in the Bunger Hills behind the Shackleton Ice Shelf. ANARE resupply ships often leave helicopters at stations for the summer, so air-ground communications are established. The days are long but there is ample sunlight available during the summer solstice — 24 hours of it!

Amateur radio activity has been encouraged in the past as an adjunct to normal means used to communicate with family and friends. The station's emergency radio shack is usually made available for this purpose. However, equipment use is necessarily restricted occasionally to avoid interference with ANARE communications or some of the sensitive scientific instruments used around the station.

As with radio communications everywhere, many frustrating hours can be spent beside the set to no avail. The sound of a clear, easy reply is greatly appreciated by the Antarctic amateur. The remoteness and isolation fade a little as contact is made and a friendly voice brings news and information from the outside world. QSOs between other Antarctic and sub-Antarctic outposts are also popular, bringing news of fellow expeditioners. If you are lucky enough to contact with an Antarctic station don't despair if no QSL card is forthcoming. The only mail service is during the shipping season when the resupply occurs, so the QSL card may be up to a year late.

The experience of working in the Antarctic leaves one with indelible memories. Special bonds of friendship are formed. The colossal forces of nature create fantastic scenes in ice and snow. Natural wonders abound. The future is bright for Antarctica. It has a major part to play in our understanding and management of the Earth. Through this article I hope to have given you an insight to this unique world.

LIST OF SOME ANTARCTIC STATIONS

STATION	CALL SIGN	QTH
Novolazarevskaya	UDY	71S 12E
Syowa	JGX	69S 40E
Molodezhnaya	RUZU	68S 63E
Mawson	VLV	68S 63E
Davis	VLZ	69S 78E
Mirny	UUT	67S 93E
Vostok	RKIS	78S 107E
Casey	VNJ	66S 111E
South Pole	NPX	90S -
Dumont D'Urville	FJY3	67S 140E
Leningradskaya	UMA4	70S 159E
McMurdo	NGD	78S 166E
Scott Base	ZLQ	78S 166E
Russkaya	UDR3	75S 137W
Rothera	ZHF45	68S 68W
Bellingshausen	UGE2	62S 59W
General Belgrano	LTA8	78S 37W
Halley Bay	VSD	76S 23W
Georg Von Neumayer	DLA	71S 08W
Sanae	ZRP	70S 02W

ABOUT THE AUTHOR

In September 1984, Bert joined the Department of Science and Technology, Antarctic Division, as a Communications Officer. He was appointed Senior Communications Officer for Davis Station and spent from November 1984 to January 1986, at the station. After returning from the Antarctic, Bert worked for some weeks at the Antarctic Division's Head Office as a relief operator in the Communications Section, whilst the permanent staff were on leave.

Bert is now employed by Television Station, SES8, in Mount Gambier, as a Senior Technician. He is not particularly active in amateur radio but endeavours to maintain an interest in amateur activities.

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An Introduction to AX.25 Link-Layer Protocol

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This paper presents an introduction to the subject of amateur packet radio implementing the AX.25 link-layer protocol for level 2, version 2.0 as described in the ARRL specification dated October 1984[1].

IT IS ALSO INTENDED to supply an overview of the protocol used by the TAPR TNC-2 software, which adheres to this specification, and describes some of the commands supported by the TNC-2.

Introduction

Packet radio is the most recent development in digital communications in amateur radio. It provides an error-free communications path over which amateur packet radio stations can be linked directly or by means of a network.

The format in which a packet of data is sent and the procedures governing a packet transmission, are described by the packet radio protocol, officially known as the *AX.25 Amateur Packet Radio Link-Layer Protocol for Level 2, Version 2.0* (AX.25L2V2).

The AX.25L2V2 protocol is based on the *International Standards Organisation* (ISO) Recommendation HDLC (High-Level Data-Link Control). The CCITT (International Telegraph and Telephone Consultative Committee) adopted and modified HDLC as part of the X.25 network interface standard, and called it LAPB (Link Access Procedure Balanced) which is compatible with HDLC[7]. Two significant extensions are made to LAPB in the amateur version called AX.25; the extended address field, and the Un-numbered Information (UI) frame — both are discussed later.

The various formats of a packet frame and the proper responses to the protocol are all controlled by a microprocessor device, called a Terminal Node Controller, or TNC. The TNC incorporates specialised firmware and software programs to correctly control the commands and responses associated with the protocol.

Packet radio stations communicate on a single frequency employing Time Domain Multiplexing (TDM) as opposed to frequency diversity as used in RTTY modes. This has the effect of increasing channel utilisation by supporting multiple packet QSOs on a shared frequency. A packet transmission sends information (data) using the ASCII code rather than a special error-correction code as is used for AMTOR[5].

Current VHF/UHF packet radio operation uses the Bell 202 modem standard running at 1200 bps FSK using tones of 1200 Hz and 2200 Hz resulting in a shift of 1000 Hz. Most HF operations below 28 MHz uses 300 bps, 200 Hz shift FSK and tones of 1600 Hz, and 1800 Hz as typical modulator tone frequencies.

General Description of Protocol

The hardware and software design employed in the TAPR TNC-2 is developed in accordance with the ISO layered network model. This model describes seven layers and is officially known as the *ISO Reference Model of Open Systems Interconnection* (OSI), or simply the ISO model for the development of computer networking.

The TAPR TNC currently implements the first two layer: viz, the Physical Layer and the Link Layer[2]. Since a detailed description of the ISO model is beyond the scope of this paper (see reference 7), only the first two layers will be discussed.

In the unbalanced mode of communications, one master device, called the DCE (Data-Circuit Terminating Equipment), is connected to one (or more) slave device/s, called DTE (Data Terminating Equipment). This type of unbalanced operation is not practical in AX.25 as presently defined, since it is assumed that both ends of the link are of the same class of device. The term DXE (Data Switching Equipment) is used to describe the balanced type of device used in AX.25 link-layer communications.

The interface between the devices operating at each end of the X.25 link consists of three distinct levels as illustrated in Figure 1a. The AX.25 interface is depicted in Figure 1b.

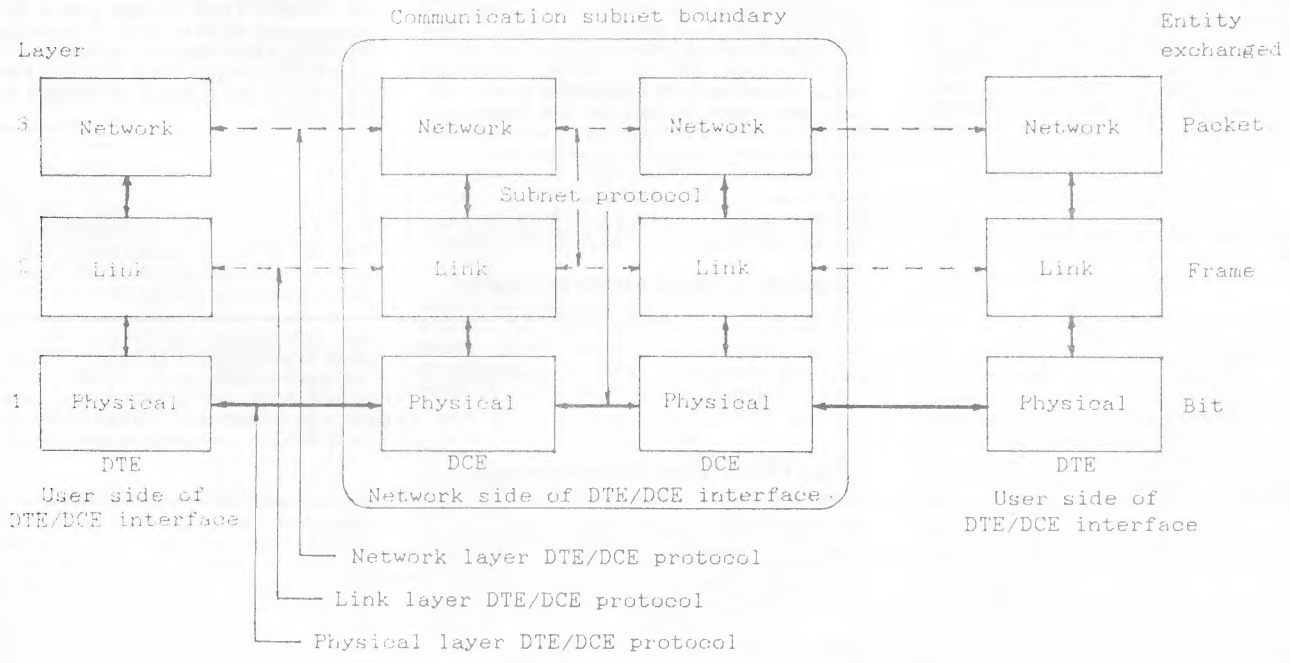

Figure 1a — Network Architecture of X.25 Interface.

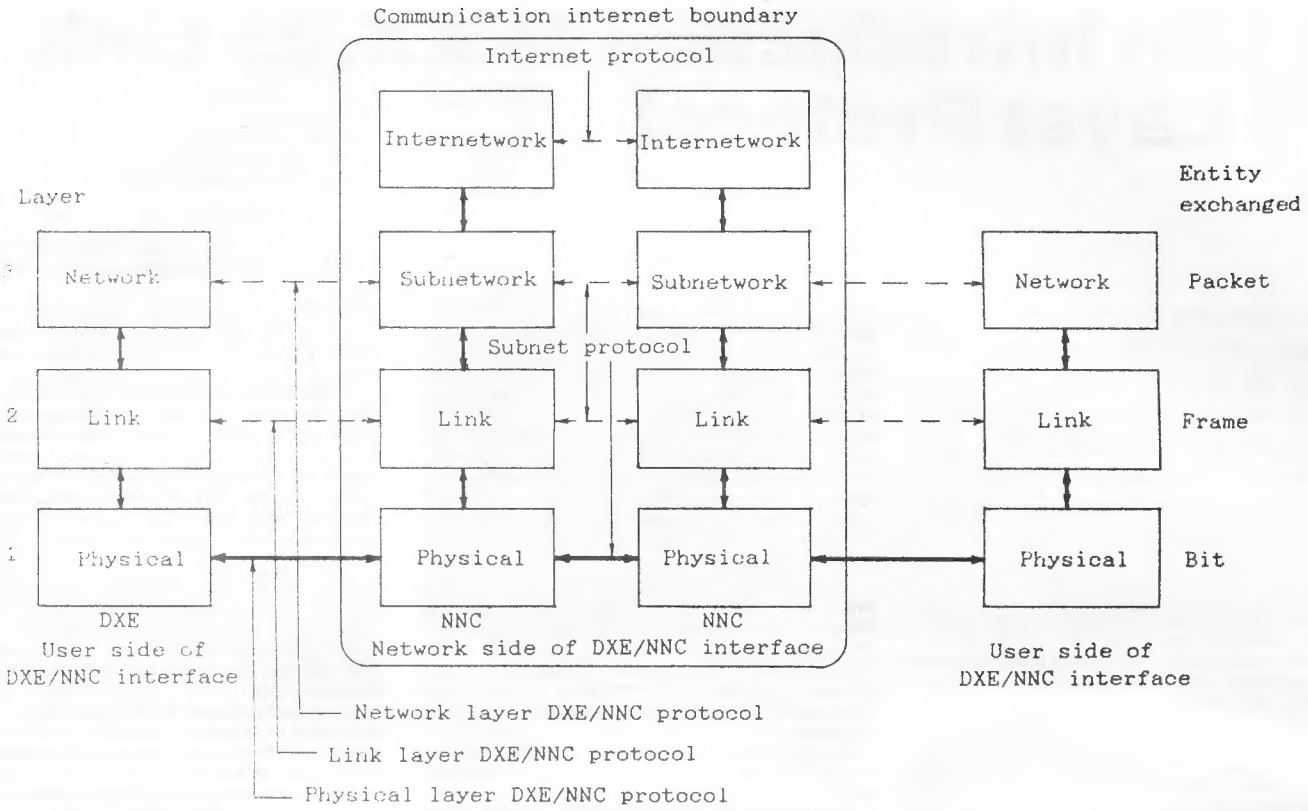

Figure 1b — Network Architecture of AX.25 Interface Depicting Level 3 Internetwork and Subnetwork Sublayers and Network Node Controller (NNC).

Level 3 Network Layer (Packet)
Level 2 Link Layer (Frame)
Level 1 Physical Layer (Bit)

Each of these levels function independently of the other level, with the exception that failures at a level may affect the operation of higher levels[6].

Data is not transferred directly from layer n at one end of the link to layer n at the other end of the link except in the lowest layer (physical). Instead, data and control information is passed from one layer to the layer immediately below it, until the lowest layer is attained. At the lowest layer there is physical communication at both ends of the link, as opposed to virtual communication used by the higher layers. In Figure 1, virtual communication is shown as broken lines and physical communication is shown as solid lines[7].

Physical Layer

The Physical Layer, layer one of the ISO Reference Model, is concerned primarily with the transmission of individual data bits over a communication channel. Several important design issues must be satisfied to ensure that each bit, which is sent by the Source or Originating station, is correctly received by the Destination station.

Typical design issues applicable to the Physical Layer include details such as voltage levels used, rate of data transmission, modem standard, and even pin designation on the interface connector.

In the amateur radio environment, data at the Physical Layer is sent over a RF link in synchronous serial bit form. In serial operation, RS-232C is accepted as the standard interface for defining voltage levels, data and handshaking signals, the types of connectors use, and the pinouts.

Flag	Address	Control	FCS	Flag
01111110	14 to 70 bytes	1 byte	2 bytes	01111110

Figure 2a — Typical Format of U and S

Flag	Address	Control	PID	Information	FCS	Flag
01111110	14 to 70 bytes	1 byte	1 byte	maximum of 256 bytes	2 bytes	01111110

Figure 2b — Typical Format of I Frame.

Destination	Source	Digipeaters (8 maximum)
7 bytes	7 bytes	0 to 56 bytes

VK6AFC (de) VK6AGC (via) VK6AAA, VK6ZZZ

Figure 2c — Typical Format of Address Subfields.

The rate of data transmission and the modem type are a function of the RF link used in amateur packet radio communications. High-speed data transfer communications at 9600 bps over a HF data path, may possibly prove to be unreliable due to the adverse effects of signal fadeout, and static noise- bursts.

Link Layer

The responsibility of the Link Layer, layer two of the ISO Reference Model, is to: transform a serial data transmission received by the Physical Layer, into a stream of data that appears to be error-free to the higher level protocols, and conversely, provide the Physical Layer with an error-free stream of data for transmission from the higher level protocols.

Since the Physical Layer merely receives and transmits a stream of data bits without any regard to meaning or structure, transmission errors are not detectable at level one. It is the responsibility of the Link Layer to ensure that data integrity is maintained through the physical devices implemented, by detecting and rejecting corrupted data, retransmitting unacknowledged data, and detecting the reception of duplicate data.

In order to assure an error-free (virtual) connection to higher level protocols, level two accomplishes this task by partitioning the data received from the higher level, to be transmitted by level one, into smaller individual blocks of data, called Frames, which are then sent to level one for actual transmission. There are three general types of AX.25 frames: the Information (I) frame, the Supervisory (S) frame, and the UN-numbered (U) frame, as illustrated in Figure 2.

Each packet frame consists of several smaller groups, called *Fields.* Each field of a packet frame is made up of an integral number of 8-bit bytes (or octets), and serves a specific function as outlined below.

Flag Field

The Flag Field is one byte in length, and consists of the binary number 01111110 (7E hex). The purpose of the flag is to delimit frames, and it therefore occurs at both the beginning and end of each frame. Consequently, two frames may share one flag, which would signify the end of the first frame and the start of the next frame.

To prevent the possibility that the flag bit sequence could inadvertently appear elsewhere in the frame, a procedure called *Bit-Stuffing* is employed. The source station continuously monitors the data-bit sequence to detect the presence of five contiguous one bits. Whenever five contiguous one bits are to be transmitted, a zero bit is inserted by the sending station immediately following the fifth one bit. Upon reception of five contiguous one bits, the destination station discards the zero bit immediately following the five one bits, thus restoring the original data-bit sequence of the frame[1].

Due to the bit-stuffing requirement, the actual length of the data-bit sequence of each frame will vary even if all information fields are of constant length. Hence, the thru-put of a packet radio network will vary slightly with the information field transmitted.

Address Field

The *Address Field* of all packet frames is used to identify both the destination and source amateur call signs for the frame. In addition, the address field contains command and response information as well as facilities for level 2 digipeater operation. If level 2 packet routing utilising digipeaters is required, the call signs of all digipeaters used are included in the address field (Figure 2c).

In the LAPB Recommendation, the address field is limited to only one byte whereas the address field of the AX.25 Recommendation has a minimum of 14 bytes, and may include a total of 70 bytes, containing the source station call sign, the destination station call sign, and an optional list of one to eight digipeater station call signs.

Station identification (call sign) is set with the command *MYCALL* (MY) which stores the users station call sign in bbRAM (battery-backed RAM).

```
cmd: MY VK6AGC
MYCALL was NOCALL
```

The TNC responds by informing the user of the previous value of the MYCALL parameter, which initially is *NOCALL*.

The final byte in each address subfield is reserved for the Secondary Station Identifier (SSID). The SSID subfield allows the operation of several packet stations under the same call sign. If the SSID extension is not specified, the value defaults to zero. The SSID is a number from 0 to 15 which is appended to the station call sign with a hyphen:

```
cmd: MY VK6AGC-2
MYCALL was VK6AGC
```

This facility is useful when a "packeteer" wishes to provide an on- air Packet Bulletin Board System (PBBS) in the LAN in addition to a regular packet station.

Control Field

The *Control Field* is used to identify the type of frame being sent, and controls the commands and responses associated with a level 2 connection in order to ensure proper link control. The control field is one byte in length and is based on the CCITT X.25 control fields for LAPB operation, and a supplementary control field derived from ADCCP (Advanced Data Communications Control Procedure) standardised by the American National Standards Institute (ANSI)[2], to allow connectionless and round-table operation — both are discussed later.

PID Field

The *Protocol Identifier* (PID) field is one byte in length and appears in HDLC information frames I and UI. The purpose of the PID field is to identify the type of level 3 protocol implemented, if any. For the AX.25 protocol at present, no level 3 protocol is implemented, and by convention the PID = $FO (11110000).

Information Field

The *Information Field* (I) is used to convey user data from the source station at one end of the link to the destination station at the other end of the link.

The I field can contain a maximum of 256 bytes in length of user information, prior to the insertion of zero bits as specified by bit-stuffing.

The maximum length of the data portion of a packet is determined by the PACLEN parameter. The TNC-2 automatically transmits a packet when the number of bytes to be transmitted reaches the user-specified PACLEN value, the default value is 128.

FCS Field

Error recovery of a packet frame depends on a mathematically derived check sum which is computed, in accordance with ISO 3309 (HDLC) Recommendations, by both the source and destination stations. The check sum consists of a 16-bit binary number, called the *Cyclic Redundancy Check* (CRC) or the *Frame Check Sequence* (FCS), and is unique to each frame.

For a particular frame, if the FCS computed by the destination station agrees with the transmitted FCS, the destination station assumes no error in the received information, and sends an ACKnowledgment back to the source station; if not, an ACK is not sent and the source station retransmits the entire frame of information.

Local Area Network

Packet radio activity is concentrated in a *Local Area Network* (LAN) which comprises several packet stations[5]. A packet QSO is initiated by a connect sequence, which sets up the "handshaking" between two packet stations, that assures a reliable communication link. The *CONNECT* (C) command is used to initiate a connect request to another station.

```
cmd: C VK6AAA
*** CONNECTED to VK6AAA
```

The *** CONNECTED to message informs the user that the connect request is successful. A packet QSO is terminated by a disconnect sequence, which leaves both stations free to initiate new QSOs. The *DISConnect* (D) command initiates a disconnect request with the currently connected station.

```
cmd: D
*** DISCONNECTED
```

The *** DISCONNECTED message indicates that the disconnect request is successful. An actual QSO might be initiated or terminated by the other station, in which case, the appropriate message would be displayed.

Occasionally, a connect sequence will be initiated that cannot by completed; this may be due to the fact that the station, with which a connection is requested, is not on air or it may not be within simplex range, or simply because the path is poor.

If the TNC does not receive a response to the initial connect request packet, after a certain time lapse, the t will be sent again. In fa03ct, the number of attempts the TNC makes is specified with the command RETRY. The default number of retry attempts is 10. Setting RETRY to 0 effectively disables the retry count and does not set a limit to the number of retries.

The retry count is also enabled once a packet QSO is established. Each packet which is received by the destination station is acknowledged (ACK), indicating that the packet was received without transmission errors. Sometimes a packet may not be received, either due to a minimal RF link prone to noise, or unintentional interference (QRM) caused by another packet station — a packet "collision." In both cases, an unacknowledged packet is retransmitted and the retry count incremented. If the maximum count set by RETRY is exceeded, the TNC automatically disconnects and displays the message:

```
*** retry count exceeded
***DISCONNECTED
```

The automatic disconnect feature prevents the TNC from indefinitely retransmitting the same packet and unnecessarily using the channel.

Digipeating

One of the very convenient features of the AX.25 level 2 protocol, as currently implemented in the Tucson Amateur Packet Radio (TAPR) TNC-2 and clones, is the capability for each packet radio station to serve as a "digipeater," for other packet stations in the LAN[2]. A digipeater is simply a standard TNC which receives (and stores) an incoming packet destined for another station, prior to retransmitting (forwarding) the packet to the destination station (or next digipeater) on the same frequency.

The current TAPR implementation allows up to eight digipeater stations in a given communication network link. This is a convenient extension of the ISO X.25 Recommendation, and forms a significant part of the difference between X.25 and the amateur version called AX.25[4].

A specified routing algorithm may be setup in the network when a direct or simplex connection is not possible, due to the unfavourable topographic nature of the LAN. This allows a packet QSO to make use of digipeaters which can automatically digipeat packets from one station to the other over a specified route.

In order to establish a connection using an intermediate digipeater station, the call sign of the digipeater is preceded by VIA in the call sign address field, and the following command is issued:

cmd: C VK6BBB VIA VK6AAA

This directs the TNC to setup a connection to VK6BBB using VK6AAA as an intermediate digipeater. When several digipeater stations are used in a particular routing strategy, the additional digipeaters are specified in the order in which they would be encountered:

cmd: C VK6CCC VIA VK6AAA, VK6BBB

In the above situation, a connect request is issued to VK6CCC using VK6AAA and VK6BBB as digipeaters.

At the present time, it is anticipated that the multiple-digipeater facility offered by AX.25L2V2 is a temporary means of providing a packet routing strategy within the LAN — thus allowing successful interconnection of stations distributed over a wide geographical coverage area — until such time that a Network Layer protocol for level 3 networking protocol is in use, digipeater links will gradually be phased out.

Optimising Channel Thru-Put

An important factor to be considered in optimising channel thru-put concerns the method by which packets are acknowledged in a multi-hop network. Communications integrity is assured by a method known as "END-TO-END ACK"[5]: the digipeater station simply relays packets without acknowledgment to the source station. The digipeater is not concerned with the type of packet being digipeated. The destination station sends its ACK back through the same digipeaters to the originating station.

Since the digipeated packets are not acknowledged by digipeaters, an unsuccessful transmission must be retried from the beginning by the originating station, thus increasing the channel congestion.

In order to minimise the resultant increase in channel congestion, which occurs when digipeated packets suffer collisions, the digipeater is given priority. Ordinary packet stations, instead of transmitting immediately after detecting a clear channel, must wait a specified period of time. This restriction applies to all stations except the digipeater, which is permitted to transmit relayed packets immediately.

Multi-Connect Operation

Multi-connect operation is a recent extension to AX.25 level 2 protocol, and allows several point-to-point connections to be established to a packet station from other stations: this occurs when more than one station requires the services of another station. This capability is extremely useful for traffic net operation, multi-user bulletin board systems, path-checking, and QSOs in general.

The multi-connect facility supports several commands, some of which are described below which the TNC-2 defaults to the following parameters.

CONPERM OFF
STREAMCAll OFF
STREAMSWitch $7C (|)
USERS 1

This configuration sets up the TNC-2 to operate in the "normal" manner which does not permit multi-connect operation. An outline of each multi-connect related command follows.

The *USERS* command controls the management of only incoming connect requests by assigning a non-allocated "stream" (connection link) to a specific incoming connect request. This has no affect on the number or management of connections that a TNC-2 may initiate, and is outlined below:

USERS 0 incoming connect on any free stream
USERS 1 incoming connect on stream A only
USERS 2 incoming connect on streams A and B
USERS 3 incoming connect on streams A, B, C

and so on through USERS 10.

To allow multiple simultaneous connections to a packet station from other stations, the USERS parameter is set to any valid setting other than USERS 1, as indicated above. The multi-connect feature allows a maximum number of 10 connections (QSOs) to be in operation simultaneously.

The *STREAMSWitch* command allows the user to specify the ASCII character ($00-$FF) which is used to select s new stream for the multiple- connect QSO/s.

When operating with multiple connections, the current QSO stream can be switched by entering the STREAMSWitch character (default | $7C), followed by a stream identifier (a character "A" to "J"). However, for this command to function properly, the STREAMSWitch character must not be one of the stream identifiers (A to J).

The *STREAMCAll* command is used to enable the display of the connected-to <call sign>, of the station with which a connection is established, following a stream identifier. This feature is particularly useful when the operation of multiple simultaneous connections is allowed.

The *STREAMCAll ON* option enables the TNC-2 user to immediately identify the stream on which a particular station is connected. Thus, an incoming packet on stream B is now displayed as "IB:<call sign>:" instead of "IB". Notice that the STREAMSWitch character and stream identifier "BI" without ":" displayed immediately following, indicates that the user entered these to switch to stream B for the multiple- connect QSOs.

In some networking applications involving marginal RF-links, such as HF work, disconnects will usually occur as a result of retried frames sent to the other station exceed the RETRY attempts to get an acknowledgment. In this situation, it may be desirable to force the TNC to initiate a subsequent connect request in order to try and re-establish the current connection. The command CONPERM, when enabled ON, is used for this scenario and is only effective when a connection is established on a particular stream.

The *CONPERM* command is employed on an individual stream basis when multi-connect operation is allowed. Connections on other streams which do not have CONPERM in effect continue to operate in the normal manner of disconnect based on RETRY.

During the multi-connect operation, it is often desirable to check the connect status of all streams in use. The *CSTATUS* command provides the user with the current link status information applicable to the 10 streams (links). The information depicts the stream identifier and the link state for each stream, the current input and output stream, and whether or not a stream link state is "permanent" as specified by CONPERM.

An example of the information displayed as a result from issuing the CSTATUS command is shown in Figure 3. This example shows the A stream is assigned the current input and output stream. The B stream is connected to VK6DDD "permanently." The D stream is connected to

cmd:CS

A stream	**IO Link State is : CONNECTED to VK6AAA**
B stream	**IO Link State is : CONNECTED to VK6DDD P**
C stream	**IO Link State is : DISCONNECTED to VK6DDD P**
D stream	**IO Link State is : CONNECTED to VK6CCC via VK6BBB**
. . .	
I stream	**IO Link State is : CONNECTED to VK6EEE**
J stream	**IO Link State is : CONNECT in progress**

Figure 3 — Link Status Information Displayed by CS Command.

VK6CCC using VK6BBB as a digipeater. All other stream states are depicted as they might normally appear with multiple connections.

Multiple simultaneous connection operation is a further development in the direction of "proper" networking, and it is anticipated that a level 3 networking protocol should eventually allow some form of multi-way operation. Multi-way operation, which is not available at this time, would provide a means to allow multiple stations within the LAN to simultaneously interconnect to each other, and thus enable each station to receive all data, passed from any station in the network, error free.

Connectionless Operation

Connectionless operation is a mode of packet communication which is not specifically accommodated by AX.25 level 2 connection protocol. This operation, called the round-table, comprises several packet stations engaged in one conversation. Although the round-table type of operation is technically outside the AX.25 level 2 connection protocol, the manner in which it is implemented still uses the HDLC frame format. A special frame, called the Unnumbered Information (UI) frame, is used for what is called "unprotocol" mode.

The UI frame contains PID and information fields and is used to pass information along the link outside the protocol flow controls. This allows information fields to be sent back and forth along the link without flow control procedures. Therefore, since the UI frame is not acknowledgeable, if one suffers a collision and is destroyed, there is no means by which it can be recovered. When no destination address subfield is specified, unconnected packets are sent as UI frames, in unprotocol mode, to the address specified by the *UNPROTO* command (default CQ).

Transmit Timing Parameters

The transmit/receive switching time delays which are characteristic for specific types of amateur radio transceivers vary considerably. Before the TNC commences sending a packet frame, sufficient keyup time delays must be imposed on the TNC, in order to ensure that the transmitter has properly "turned-on" and the receiver has had adequate time to synchronise on the incoming signal, otherwise the packet will not be received correctly.

The time delay between the transmitter keyup and the actual commencement of packet transmission is governed by the command *TXDELAY.* During the time interval that the TNC is keying the transmitter, but not actually sending information, a continuous series of synchronising audio signals (flags) are sent. This allows the detection of a busy channel more reliable. The TXDELAY is a value from 0 to 120 and is specified in 10 msec increments.

If an audio repeater is being used to repeat packets (which works fine), the necessary keyup delay may need to be increased considerably in comparison to the delay required

for direct or point-to-point communications. However, once the audio repeater is in use and has not had time to "drop out" since the last transmission, the additional keyup delay is not required.

The command *AXDELAY* is used to specify the additional time delay the TNC is required to wait once the transmitter is keyed. This parameter is useful for packet stations using audio repeaters to extend the coverage of the local area network. The AXDELAY is a value from 0 to 180 specified in 10 msec increments.

The command *AXHANG* is specifically used to increase channel efficiency when an audio repeater with a "hang-time" greater than 100 msec is used. AXHANG specifies the audio repeater hang-time in 100 msec intervals. For a repeater with a long hang-time, in excess of 100 msec, it is not necessary to impose the repeater keyup delay (AXDELAY), after the transmitter of a packet station is keyed, if the repeater is still transmitting. Hence, if the TNC has detected a packet sent during the hang-time of an audio repeater, the repeater keyup delay (AXDELAY) is not added to the transmitter keyup delay (TXDELAY).

The total combined keyup delay is given by the equation below:

Keyup delay = (TXDELAY+AXDELAY)*10 msec

If channel activity is detected within the time interval AXHANG*100 msec, the keyup delay is given by:

Keyup delay = TXDELAY*10 msec

Packet Timing Considerations

The AX.25 link-layer protocol automatically provides for the retransmission of packets if no acknowledgment is received from the destination station within a certain period of time. There are several reasons why a packet might not be ACKed: channel noise may corrupt the packet transmission, the packet might suffer a collision with another packet transmission, the channel may be congested by other packet stations thereby preventing the destination station from sending an ACK immediately, or the ACK may subsequently suffer a collision.

The time lapse imposed before the source station retransmits the packet is specified by the command *FRACK* (FRame ACKnowledge time). If the source station does not receive an ACK within the frame acknowledge time, the RETRY counter is incremented and the frame is sent again.

If the address field of a packet frame includes the call signs of digipeaters, the time delay between retries is adjusted accordingly:

Retry interval = FRACK*(2n+1) sec

where n is the number of intermediate digipeaters used in the link, the FRACK is a value from 1 to 15 specifying frame acknowledge time in one second intervals.

In a multi-hop network, an important aspect of AX.25 protocol is the means by which each station utilises the information about channel activity obtained by listening to the channel. *CSMA* (Carrier-Sensed Multiple Access) is the basis for which time domain multiplexing is utilised to achieve maximum channel thru-put with minimum interference.

The TNC monitors for the presence of a RF data-carrier on the channel, and once a data-carrier is detected (DCD) the TNC will not transmit until after a specified time delay has expired since the DCD condition cleared. Furthermore, in order to minimise the probability of a collision, a wait time interval can be imposed on the TNC before a packet is transmitted.

The wait time is set by the command *DWAIT* which is a value from 0 to 250 specifying 10 msec intervals. Thus, an optional automatic wait time (DWAIT) can be imposed on any packet station not digipeating a packet. This wait time is intended to help alleviate the drastic reduction of thru-put that occurs on a channel when digipeated packets suffer collisions.

If the users of a local area network do not require the use of digipeaters, the DWAIT parameter can be set to 0, but in any case DWAIT should be set to the same mutually acceptable value by all users of the LAN.

The time delay incurred between the receipt of a packet and the subsequent transmission of the acknowledgment packet is set by the command *RESPTIME*. This delay runs concurrently with the imposed wait set by DWAIT and any random wait in effect. During normal packet operation the RESPTIME delay can be set to 0. The default value is 12. The delay is a value from 0 to 250 specifying 100 msec intervals.

This delay can be used to increase channel thru-put during data-file transfer operations when the maximum number of full-length packets is usually sent. RESPTIME is specifically used to prevent collision between an acknowledgment packet and another packet from the source station.

In a multihop network employing digipeaters, the probability of either the original packet or the acknowledgment being destroyed due to a packet collision, increases drastically with the number of digipeaters used.

In order to avoid unnecessary packet retries, the protocol implements a collision avoidance strategy which applies to all packets except those being digipeated. On subsequent transmissions of a particular packet, the TNC waits an additional random time after detecting a clear channel before commencing a retry keyup procedure. This helps prevent repeated collisions of packets by the same two stations.

The additional random time is a multiple of the TXDELAY parameter. The interval between the TNC detecting cessation of a carrier and beginning to transmit is:

wait time = DWAIT*10 msec

for the initial transmission of a packet.

For subsequent transmissions of the same packet the interval is:

wait time = DWAIT*10+(r*TXDELAY)*10 msec

where r is a random generated number from 0 to 15.

Several packets may be transmitted before waiting for an acknowledgment. The maximum number of unacknowledged packets, which the TNC can have outstanding at any one time, is specified by the command *MAXFRAME*. This parameter also sets the maximum number of packets which the TNC can send during a single transmission. The default value is four and the maximum value is seven packets.

If some, but not all, of the outstanding packets are acknowledged, a smaller number may be transmitted the next time, or new frames may be included in the retransmission, so that the total unacknowledged packets does not exceed the value set by MAXFRAME.

MAXFRAME in combination with PACLEN, which sets the maximum number of bytes in the information field of a packet, determines the quantity of information which can be sent in a single transmission. The optimal combination for efficient data-file transfers is determined by experimentation and is dependent on the quality of the link used.

Conclusion

Most radio amateurs using packet radio today are using the AX.25 level 2 standard, and the majority of packet systems available support the AX.25 level 2 protocol. AX.25 level 2 protocol has been proven and accepted as a practical protocol in the amateur packet radio environment.

Since packet radio is still in the development stage, suitable extensions, based on field feedback from active packet users (packeteers), undoubtedly will be implemented in some technical specifications as the mode attracts more users.

It is hoped that this paper will assist the newcomer to amateur packet radio understand the fundamentals of the AX.25 link-layer protocol, by using the TAPR TNC-2 as a basis for discussion. Furthermore, I hope that this introduction to the subject of amateur packet radio invokes interest in potential packet radio enthusiasts.

References

1 FOX, TERRY. WB4JFI. *AX.25 Amateur Packet Radio Link-Layer Protocol, Version 2.0,* ARRL, October 1984.

2 FOX, TERRY. WB4JFI. *"ISO Reference Model Review",* Proceedings of the Third ARRL Amateur Radio Computer Networking Conference, ARRL, April 1984.

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5 MCDERMOTT, T C. N5EG. *"An Introduction to Networks",* PSR Quarterly, Tucson Amateur Packet Radio, # 16, July 1985.

6 RYBCZYNSKI, ANTONY. *"X.25 Interface and End-to-End Virtual Circuit Service Characteristics",* IEEE Transactions on Communications, April 1980.

7 TANENBAUM, ANDREW S. *Computer Networks,* Prentice-Hall, 1981.

8 TAPR. *Packet Radio Terminal Node Controller TNC 2, Rev 2 System Manual. Second Edition.* Tucson Amateur Packet Radio, August 1985.

Glossary

ADCCP. Advanced Data Communication Control Procedure standardised by ANSI.

ANSI. American National Standards Institute.

AX.25L2V-2. ARRL Specification entitled, "AX.25 Amateur Packet Radio Link-Layer Protocol, Version 2.0".

Balanced. Devices operating at both ends of the link communicate with one another as equals.

CCITT. International Telegraph and Telephone Consultative Committee, a part of the International Telecommunication Union (ITU).

DCE. Data Circuit-terminating Equipment, a master device operating in unbalanced mode of the X.25 link layer.

DTE. Data Terminal Equipment, a slave device operating in unbalanced mode of the X.25 link layer.

DXE. Data Switching Equipment, a device (neither master or slave) operating in balanced mode of the AX.25 link layer.

HGLC. High-level Data-Link Control Procedures, a specification as defined in ISO 3309 standard.

ISO. International Standards Organisation.

ISO3309. International standard entitled, "Data Communication High- Level Data-Link Control Procedures — Frame Structure".

LAN. Local Area (Access) Network, comprises several packet stations operating within a local geographical service area.

LAPB. Link Access Procedure Balanced, a link layer protocol for X.25 balanced-mode communications developed by CCITT.

NNC. Network Node Controller, a device used to interconnect local area networks.

OSI. Open Systems Interconnection, a communications protocol reference model defined by the ISO.

TAPR. Tucson Amateur Packet Radio Corporation, a non-profit organisation involved in amateur packet radio research and development.

X.25. CCITT Recommendation entitled, "Interface between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Terminals Operating in the Packet Mode on Public Data Networks".

ar

Feedline Data Calculations for the VZ200/300

Rick Buhre VK4AIM
41 Mogford Street, Mackay, Qld. 4740

This program came about when the price of the VZ200 dropped dramatically.

The story of how this program came about is simple, but I believe it could be of interest. It all began when the price dropped on the VZ200 and Wal VK4AIV, bought one.

After learning the basics of its operation, he began to search for useful programs involving amateur radio, finding them few and far between.

Much later, I purchased a VZ300 at the same price as Wal's VZ200 and naturally asked Wal what programs he had.

Upon discovering the scarcity, I sat down and wrote a series of short programs to ease the problems of endless work with calculator, pen and paper, for amateur radio work.

Copies of these programs were given to Wal, who tidied them up and tied them together. This listing is part of the result.

The program is to enable those interested to quickly calculate parameters for the construction of coaxial cable or open wire feeder sections for matching antennas to feedlines.

The calculations are derived from standard amateur radio books and simply are converted into Basic statements.

They are as follows:

COAXIAL CABLE DATA

1 Impedance of a cable of a given size.
2 Inside diameter of outer conductor for a given impedance and inner conductor size.
3 Outside diameter of inner conductor for a given impedance and outer conductor size.
4 Cut off frequency for a cable of given size and impedance.

OPEN WIRE FEEDER DATA

1 Impedance of feeders of known wire size and spacing.
2 Spacing required for a given wire size and impedance.

There is space in the program for future additions to be inserted. I hope many amateurs will find it of use.

```
10 CLS:GOSUB2000
20 PRINT@99,"1- COAXIAL CABLE DATA"
30 PRINT@195,"2- OPEN WIRE FEEDER DATA "
40 PRINT@291,"3- "
50 PRINT@387, "4- "
60 PRINT@448,"CHOOSE OPTION" INPUTN
70 IFN=1THEN100
80 IFN=2THEN2000
85 REM*****************
90 REM*********************
100 GOSUB2000
110 PRINT@99,"1-IMPEDANCE OF COAXIAL"
120 PRINT@131,"          CABLE"
130 PRINT@195,"2-INSIDE DIA.OF OUTER"
140 PRINT@227,"        CONDUCTOR"
150 PRINT@291,"3-OUTSIDE DIA.OF INNER"
160 PRINT@387,"4-CUT OFF FREQUENCY"
170 PRINT@448,"CHOOSE OPTION":INPUTN
180 IFN=1THEN500:
190 IFN=2THEN1000
200 IFN=3THEN1200
210 IFN=4THEN1400
220 IFN<1THEN1010
230 IFN>4THEN1010
235 REM**********************
240 REM*****************
500 GOSUB2500
510 INPUT"ENTER INSIDE DIAMETER OF OUTER CONDUCTOR";D1
520 INPUT"ENTER OUTSIDE DIAMETER OF INNER CONDUCTOR";D0
530 X=SQR(K)
540 Y=D1/D0
550 Z=LOG(Y)/2.30259
560 W=138*Z/X
570 PRINTW;"OHMS IMPEDENCE"
```

```
580 PRINT"ANOTHER TRY?Y,N"
590 INPUTA$
600 IFA$=CHR$(89)THEN500
610 IFA$=CHR$(78)THEN10
620 REM**********************
630 REM**********************
1000 GOSUB2500
1010 INPUT"ENTER IMPEDANCE";Z
1020 INPUT"ENTER OUTSIDE DIAMETEROF INNER CONDUCTOR";D
1030 X=SQR(K):Y=Z*X/138
1040 W=(10^Y)*D
1050 PRINT"INSIDE DIAMETER OF OUTER CONDUCTOR=";W
1060 PRINT"ANOTHER TRY?Y,N"
1070 INPUTA$
1080 IFA$=CHR$(89)THEN1000
1090 IFA$=CHR$(78)THEN10
1091 REM**********************
1092 REM**********************
1200 GOSUB2500
1210 INPUT"ENTER INPEDANCE";Z
1220 INPUT"ENTER INSIDE DIAMETER OF OUTER CONDUCTOR";D
1230 T=SQR(K)
1240 U=Z*T/138
1250 V=10^U
1260 W=1/V
1280 X=W*D
1290 PRINT"OUTSIDE DIAMETER OF INNER CONDUCTOR=";X
1300 PRINT"ANOTHER TRY?Y,N"
1310 INPUTA$
1320 IFA$=CHR$(89)THEN1200
1330 IFA$=CHR$(78)THEN10
1390 REM**********************
1391 REM**********************
1400 GOSUB2500
1410 INPUT"ENTER INSIDE DIA.OUTER CONDUCTOR";D1
1420 INPUT"ENTER OUTSIDE DIA.INNER CONDUCTOR";D0
1430 Z=SQR(K)
1440 X=7520/(D1+D0)*Z
1450 PRINT"CUT OFF FREQUENCY=";X;"MHZ"
1460 PRINT"ANOTHER TRY?Y,N"
1470 INPUTA$
1480 IFA$=CHR$(89)THEN1400
1490 IFA$=CHR$(78)THEN10
1491 REM**********************
1492 REM**********************
1616 REM**********************
2000 GOSUB3000
2010 PRINT@99,"1-IMPEDANCE OF OPEN"
2020 PRINT@131,"      WIRE FEEDER"
2030 PPINT@195,"2-SPACING OF OPEN"
2040 PRINT@227,"       WIRE FEEDER"
2050 PRINT@291,"3- "
2060 PRINT@327,"4-"
2070 PRINT@448,"CHOOSE OPTION":INPUTN
2090 IFN=2THEN2400
2100 IFN=1THEN2200
2110 A$=INKEY$:IFA$<>CHR$(45)THEN2110
2120 IFA$=CHR$(45)THEN10
```

```
2191 REM**********************
2200 CLS:PRINT"OPEN WIRE IMPEDANCE"
2210 INPUT"SPACING";D1
2220 INPUT"DIA OF WIRE";D2
2230 X=D1/D2
2240 W=X+SQR(X*X-1)
2250 Y=LOG(W)/2.30259
2260 Z=Y*276
2270 PRINT:PRINT"OHMS IMPEDANCE"
2280 PRINT"ANOTHER TRY?Y,N"
2290 INPUTA$
2300 IFA$=CHR$(89)THEN2200
2310 IFA$=CHR$(78)THEN10
2400 CLS:PRINT"TO FIND SPACING OPEN WIRE"
2410 INPUT"ENTER IMP";Z0
2420 INPUT"WIRE DIA";D
2430 X=Z0/276:Y=10^X:D=D*(Y+1/Y-1):S=D/(2*Y):PRINT"SPACING=";S
2440 PRINT"ANOTHER TRY?Y,N"
2450 INPUTA$
2460 IFA$=CHR$(89)THEN2400
2470 IFA$=CHR$(78)THEN10
2500 CLS:PRINT:PRINT"DIELECTRIC CONSTANTS:":PRINT"AIR=1"
2510 PRINT"POLYTHENE=2.25":PRINT"PARAFFIN WAX=1.9"
2520 PRINT"TEFLON=2.1"
2530 INPUT"ENTER DIELECTRIC CONSTANT",E
2570 RETURN
2571 REM**********************
3000 CLS:PRINT@0,"*************************************"
3010 PRINT@32,"*        +++++MENU+++++             *"
3020 PRINT@64,"*                                   *"
3035 PRINT@96,"*                                   *"
3040 PRINT@128,"*                                  *"
3050 PRINT@160,"*                                  *"
3060 PRINT@192,"*                                  *"
3070 PRINT@224,"*                                  *"
3080 PRINT@256,"*                                  *"
3090 PRINT@288,"*                                  *"
3100 PRINT@320,"*                                  *"
3110 PRINT@352,"*                                  *"
3120 PRINT@384,"*                                  *"
3130  PRINT@416,"*************************************"
3140 RETURN
```

THE FIRST

All historians face the same dilemma, *"Who was **the first** to achieve this or that ???* Many firsts are credited to the 'inventor of radio', Marconi — however, the truth is that this great man was more an improver and entrepreneur than an inventor.

Below is an extract from the *Wireless Weekly* dated November 17, 1922. At the time when the undermentioned David Hughes was conducting his experiments in the 1870s, Marconi was a very young child.

FIRST WIRELESS FIND IN LONDON

"The crude, but sensitive instruments with which David Hughes first discovered wireless waves have been unearthed in a London tenement and transferred to a place of honour in the South Kensington Museum.

"Hughes experimented with electric waves long before Marconi, but the latter gained the distinction of being the discoverer because he was the first to recognise them as ether waves.

"The newly found instruments consist of a spring-wound device that sent out electric impulses at regular intervals and a carbon microphone used by Hughes as the detector. History tells us that during an experiment in 1879, Hughes started the transmitter and then walked slowly away from his laboratory with the receiver in his hand, noting how far the sounds could be detected. At times he was able to hear them 50 feet distant.

"Although Hughes was an extremely able scientist, he lived and worked in a frugal manner. Most of his instruments were made up of odds and ends, such as pins, needles, scraps of wire and pieces of metal utensils. Yet, even with these, he was able to produce delicate mechanisms that were the forerunner of those in operation today.

"The carbon grain transmitter was first tested by Hughes and a widely used electrical device known as an induction balance was invented by him. Later, he published a theory of magnetism that brought him distinction.

"Hughes was born in America where he lived during his early years; but after inventing a printing telegraph, he moved to England and the Continent. There he tried for many years to have the machine approved by foreign telegraph firms. Finally, after being accepted by the French Government, it was adopted by all the leading companies and brought wealth to the inventor."

(Many brilliant experimenters never gained proper recognition).

—Courtesy Alan Shawsmith VK4SS

THE WHITE LADY

Next time you become the owner of an old piece of something or other — like an ancient car, a radio, or item of furniture — take the time to ponder on its past life. Just for a moment let your imagination have a free rein. In my mini-museum are vintage bits and pieces of all kinds; could they talk, some wondrous even bizarre tales would be told.

Let me relate the true story of one of my radio masts, a high quality dead-straight spar of oregon pine 35 feet (10m) in length. Because of the whims of destiny it had circumnavigated the globe as part of a sailing ship, more times than can be known. Later it was almost destroyed by fire but survived to serve several amateurs admirably, finally doing yeoman service at the Ionospheric Research Station at the University of Queensland.

I nicknamed the pole "The White Lady"; males always refer to ships or parts thereof in the feminine gender. After a few coats of white paint it stood stark and clear against the sky. It (or she) came into my possession in 1935 when visiting my uncle, a sea captain. Pointing to the 50 feet (15m) spar he said, "I pulled her off an old burnt windjammer in Moreton Bay. She must be 60-years old — but still as sound as the day they milled her in the States — and she's been south of the Horn more than once I'll wager. If she's any use — take her!"

I did take her, with alacrity. The mast was round (almost 6 inches (150 mm) in diameter) and untapered, with a slight heat scorch mark at one spot, and she stretched before me straight-as-a-die — a beautiful piece of timber. I wondered about the tall erect tree from which she had been cut.

Lack of ground space demanded I shorten it to approximately 35 feet (10m), a process as painful as cutting off an arm. Until WWII was declared in 1939 it stood erect at my Dutton Park QTH, when, on receipt of that infamous 'red' (actually pink) telegram from the PMG, it was lowered with tenderness to the ground and stored for the next six years.

In 1946, the White Lady was taken 'out of mothballs', transported and re-erected at my new QTH in West End. Here, because I had lost my head for heights, climbing spikes were inserted every 18 inches (450 mm) — about 20 in all. This proved to be another unpleasant operation, like drilling teeth. Visiting amateurs, especially ex-Navy W/OS could run up and down it like a rigger but I still tackled it with great caution.

Gordon VK4EK and Gil VK4CF, removed it in 1949 and took it to the former's QTH. Three years later Gil, of Mitchelton, assumed ownership but did not put it into use; he subsequently gave it to Gerry VK4CF, who then donated it to the Radio Physics Department of the University of Queensland for their research into Whistling Atmospherics, which was conducted by Dr R W E McNicol VK4WM (SK 1974) at Moggill. It remained there in regular service for all passers-by to see, being well maintained and painted (TLC) until it finally collapsed during the great Brisbane flood of 1974. A survivor of cyclone and fire, the deluge of that year proved too much.

So the White Lady was finally laid to rest at the ripe old age of somewhere around 100 years. Who would deny that for the roles it played, miles it travelled, service it rendered and pleasure it gave to so many on sea and land it sure was a mighty stick of wood. No wonder I remember with affection the White Lady and the DX it helped me work.

—Courtesy Alan Shawsmith, VK4SS.

The White Lady (at left) on site at Ionospheric Research Station, Moggill, Queensland.

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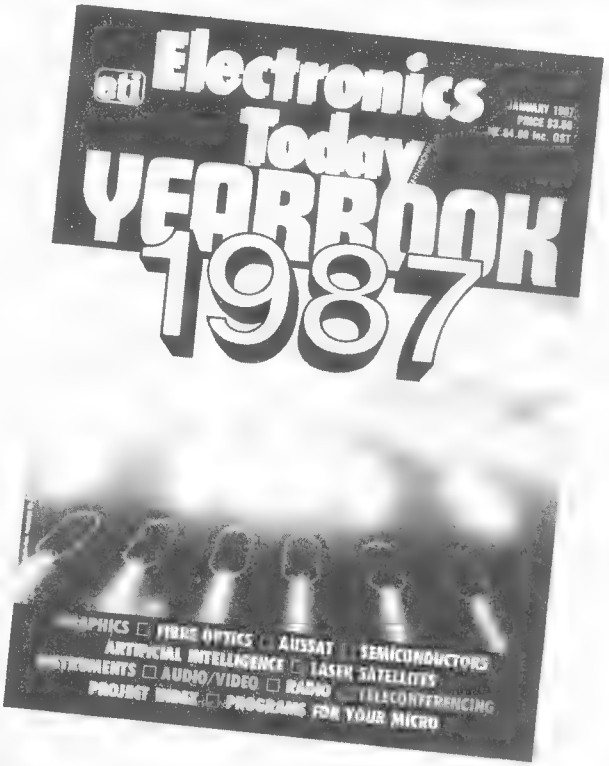
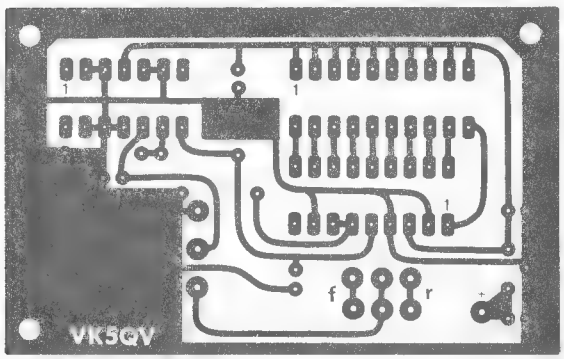


Try This!

NO FUSS PRINTED CIRCUIT BOARDS

Ivan Huser VK5QV
7 Bond Street, Mount Gambier, SA 5290



This method of PCB production allows quality boards to be produced literally on the kitchen table.

The method was devised by Dr Roland Milker, a German chemist, and simplifies Printed Circuit Board production to just three easy steps.

1 The required pattern is photocopied onto plastic film.

2 The positive image on the film is then transferred to the copper laminate using an ordinary domestic smoothing iron.

3 After the film is removed, the board is then etched in the normal way.

My introduction to this intriguing method of reproducing printed circuit boards came when I acquired some TEC-200[1] plastic film especially developed for the purpose. My first attempts were absolute disasters and with my valuable stock of film being rapidly devoured by my wife's smoothing iron, I sought an alternative product with which I could experiment.

After trying several different plastic films with varying degrees of success, I decided to try the film used for making overhead projector transparencies on a photocopier and — eureka — it worked!

PHOTOCOPYING

Any photocopier that heat fuses a toner onto plain paper may be used as long as it is in good condition and in particular, has a clean roller.

The overhead projector film[2] used has a smooth and a not so smooth side. It is *essential* that when used in this application, the copy be made on the *smooth* side.

Because of the nature of the image transfer process, the master used must be a *mirror image* (component side view) of the desired copper pattern. If the pattern is obtained from a magazine, an intermediate transparency will almost certainly have to be made and then reversed using the photocopier. If however, you are making your own master, then it should be produced as a mirror image to avoid the need for the intermediate step.

Place the PCB pattern, as published in a magazine or your own master, on the photocopier and run a paper copy to gauge the quality. Adjust the machine if necessary until a good dark copy with a clear background is obtained.

Place a sheet of plastic film *smooth side up* in the tray of the photocopier and run a copy. Check for quality and, if necessary, run another copy.

IMAGE TRANSFER

Thoroughly clean the copper laminate using a mild abrasive such as a scouring pad or a piece of steel wool and then clean the surface with acetone or a good quality proprietary line of PCB cleaner. *Do not omit this last cleaning process.*

The board should then be warmed in a hot oven for a few minutes so that it does not sink too much of the heat from the iron during the transfer process.

Cut the pattern to be transferred from the plastic sheet allowing about 20 mm clearance around the pattern. Place the film on the warm laminate with the toner side in contact with the copper and cover with a thin cotton cloth. An old handkerchief is ideal.

With the iron temperature around 150 degrees Celsius, lightly apply the iron to the handkerchief until the pattern adheres to the copper. Once the plastic film has adhered, apply a *firm* pressure and carefully smooth the entire area to be transferred until the temperature of the board is close to that of the iron. This takes around 30 seconds or so for a medium size board. The handkerchief and plastic film can now be carefully peeled from the laminate to reveal the transferred pattern.

Note that the film *must be removed from the laminate whilst hot.* If the plastic film is removed when cold, the toner becomes brittle and parts of the pattern will come away with the film.

The quality of image transfer is a function of temperature, time and pressure and some experimentation will be necessary to develop the 'feel' for the process. For the smoothing iron I used, the best setting was found to be at the low end of the cotton range. It was confirmed using an iron pyrometer that the iron was cutting out at 150 degrees Celsius and it is suggested that time could be save if your local appliance repairman could set your iron at this temperature for you.

ETCHING

As soon as the board has cooled and the toner hardened to produce a resist, the board can be etched using your favourite etchant and then sprayed with a protective lacquer.

It is suggested that an active etching agent be used to reduce the problem of undercutting associated with long etching times.

FINALE

If you have access to a photocopier and follow the procedure outlined in this short article, you probably will not be too far removed from producing an acceptable board with your first try.

The more complex the PCB pattern and the finer the lines, the more critical will be the relationship between temperature, time and pressure. With care however, this procedure should be quite satisfactory for most requirements.

Good Luck!

Notes:

1 TEC-200 is a trademark of the Meadowlake Corp — New York.

2 0.004 inch (0.1 mm) OHP film is available from stationery suppliers.

References:

1 Making Printed Circuit Boards — Dr Roland Milker — *Radio and Electronics World,* November 1985.

2 TEC-200 Technical Bulletin — The Meadowlake Corp, PO Box 497, Northport, New York, 11768.

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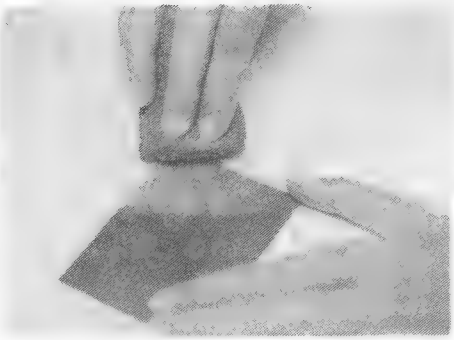
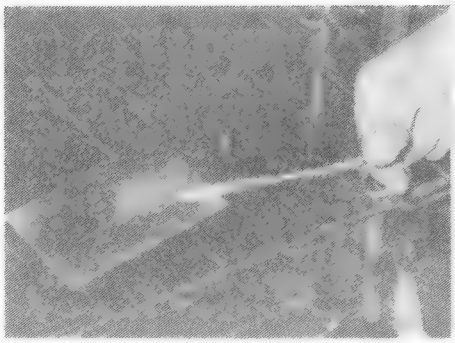
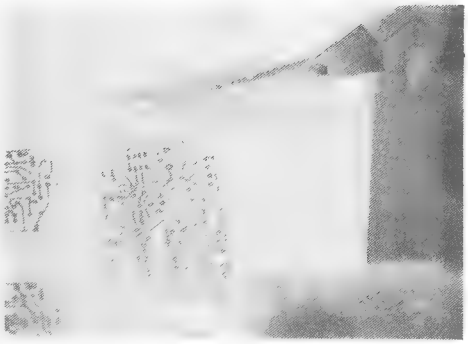
—Photographs courtesy Belken Productions



1. Thoroughly clean the copper laminate using a mild abrasive such as a scouring pad or a piece of steel wool and then clean the surface with acetone or a good quality proprietary line of PCB cleaner.



2. The board should then be warmed in a hot oven for a few minutes so that it does not sink too much of the heat from the iron during the transfer process.



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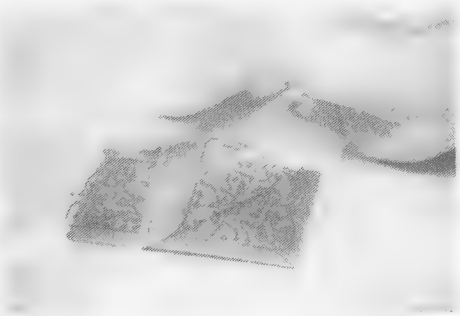

5. The handkerchief and plastic film can now be carefully peeled from the laminate to reveal the transferred pattern. The film must be removed from the laminate whilst hot. If the plastic film is removed when cold, the toner becomes brittle and parts of the pattern will come away with the film.

6. As soon as the board has cooled and the toner hardened to produce a resist, the board can be etched using your favourite etchant and then sprayed with a protective lacquer.

CAUTION: Etching and photosensitive chemicals are toxic — take adequate precautions.

RADIO FREQUENCY MANAGEMENT OPERATIONS BRANCH OFFICES

* HEADQUARTERS *

ASSISTANT SECRETARY, Benjamin Offices, Belconnen, Canberra, ACT. 2617. (Postal: PO Box 34, Belconnen, ACT. 2616). Telephone: (062) 64 4608

* AUSTRALIAN CAPITAL TERRITORY *

DISTRICT RADIO INSPECTOR, Shop 5, Level 3, Block F (Aqua), Benjamin Offices, Belconnen, ACT. 2617. Telephone: (062) 64 4677. (Postal: PO Box 132, Belconnen, ACT. 2616)

* NEW SOUTH WALES *

STATE MANAGER, Upper Ground Floor, MLC Building, 105-153 Miller Street, North Sydney, NSW. 2060. Telephone: (02) 922 9111. (Postal: PO Box 970, North Sydney, NSW. 2060)

DISTRICT RADIO INSPECTOR, Australian Government Offices, 218 Molesworth Street, Lismore, NSW. 2480. Telephone: (066) 21 6393

DISTRICT RADIO INSPECTOR, Suite 8A, First Floor, Tonella Commercial Centre, 125 Bull Street, Newcastle West, NSW. 2302. Telephone: (049) 26 4199. (Postal: PO Box 5190C, Newcastle West, NSW. 2302)

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* VICTORIA *

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DISTRICT RADIO INSPECTOR, 56 Nunn Street, Benalla. Vic. 3672 Telephone: (057) 62 3288

DISTRICT RADIO INSPECTOR, First Floor, National Mutual Building, 5 View Point, Bendigo, Vic. 3550. Telephone: (054) 43 1110. (Postal: PO Box 40 Bendigo, Vic. 3550)

DISTRICT RADIO INSPECTOR, Suite 5A, Bass Court, 398 Raymond Street, Sale, Vic. 3850. Telephone: (051) 44 4555

* QUEENSLAND *

STATE MANAGER, Tenth Floor, Aviation House, Corner Wickham and Ballow Streets, Fortitude Valley, Qld. 4006. Telephone: (07) 52 8822. (Postal: PO Box 555, Fortitude Valley, Qld. 4006)

DISTRICT RADIO INSPECTOR, Lonsdale Court, Corner Walker and Targo Street, Bundaberg, Qld. 4670. Telephone: (071) 72 2111. (Postal: PO Box 862, Bundaberg, Qld. 4670)

DISTRICT RADIO INSPECTOR, State Government Insurance Office, Corner Shields Street and The Esplanade, Cairns, Qld. 4870. Telephone: (070) 51 4333. (Postal: PO Box 1225, Cairns, Qld. 4870)

DISTRICT RADIO INSPECTOR, 2A Sydney Street, Mackay, Qld. 4740. Telephone: (079) 51 1828. (Postal: PO Box 337, Mackay, Qld. 4740)

DISTRICT RADIO INSPECTOR, 6 East Street, Rockhampton, Qld. 4700. Telephone: (079) 27 6922. (Postal: PO Box 1401, Rockhampton, Qld. 4700)

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DISTRICT RADIO INSPECTOR, 40 James Street, Mount Gambier, SA. 5290. Telephone: (087) 25 6170. (Postal: PO Box 1545, Mount Gambier, SA. 5290)

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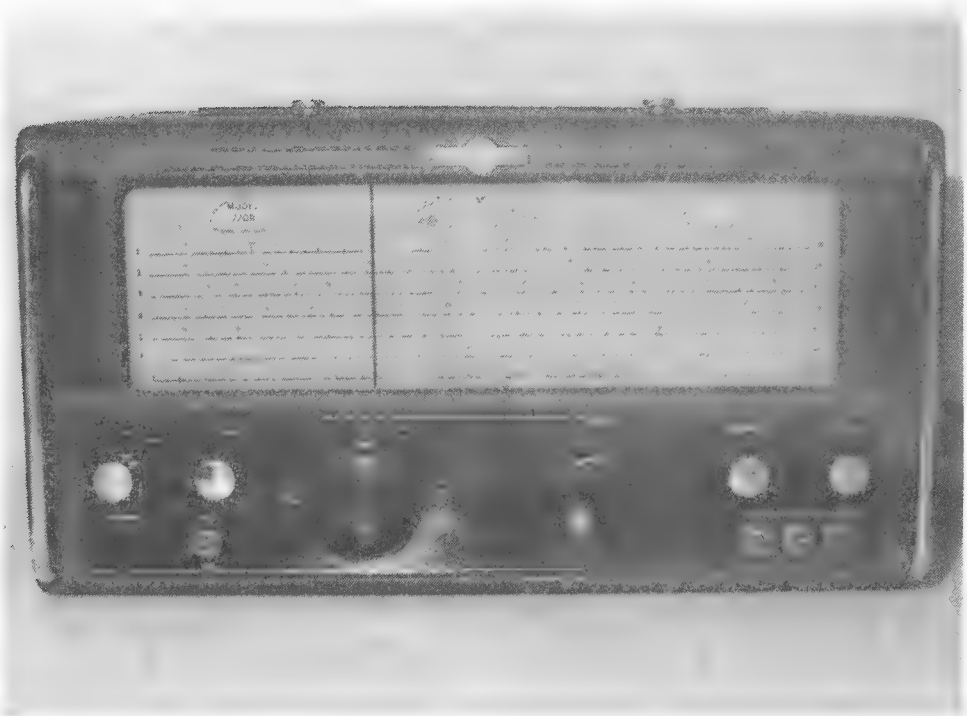
CLASSIC COMMUNICATIONS EQUIPMENT

The EDDYSTONE 770R VHF RECEIVER

Colin MacKinnon VK2DYM
52 Mills Road, Glenhaven, NSW. 2154

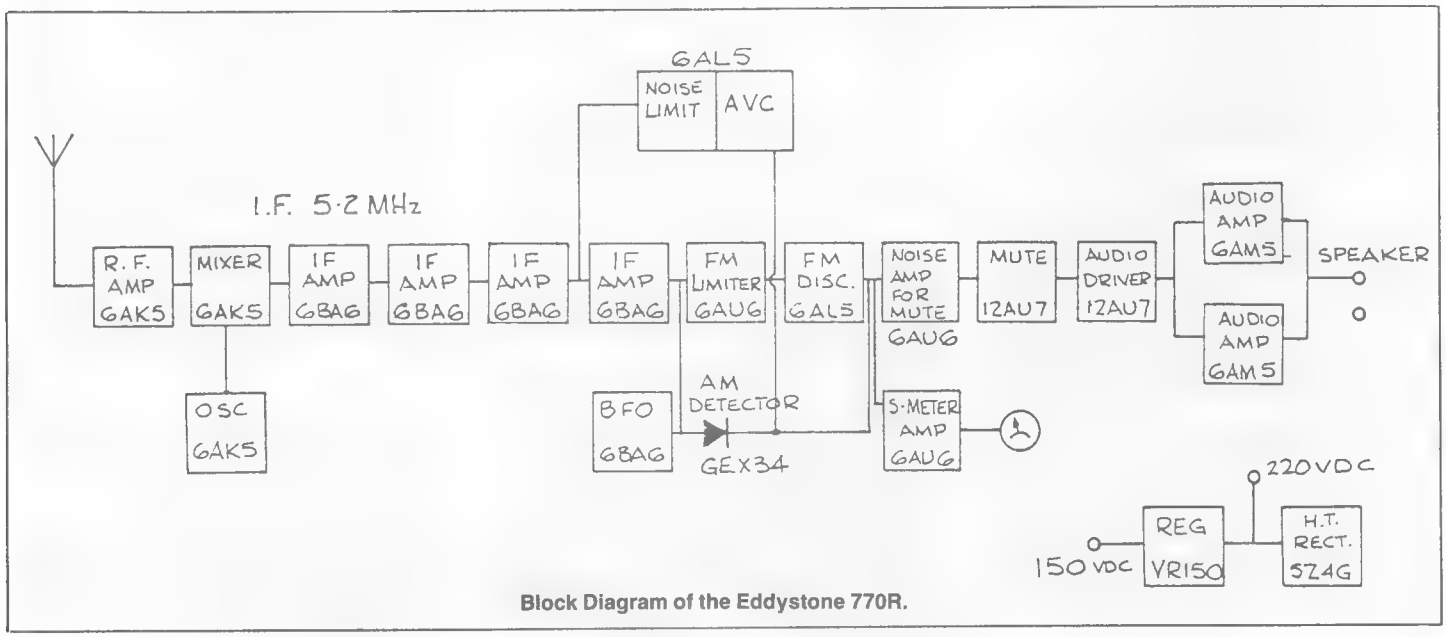


The 770R is a 19 valve, general coverage receiver giving continuous coverage from 19 to 165 MHz.

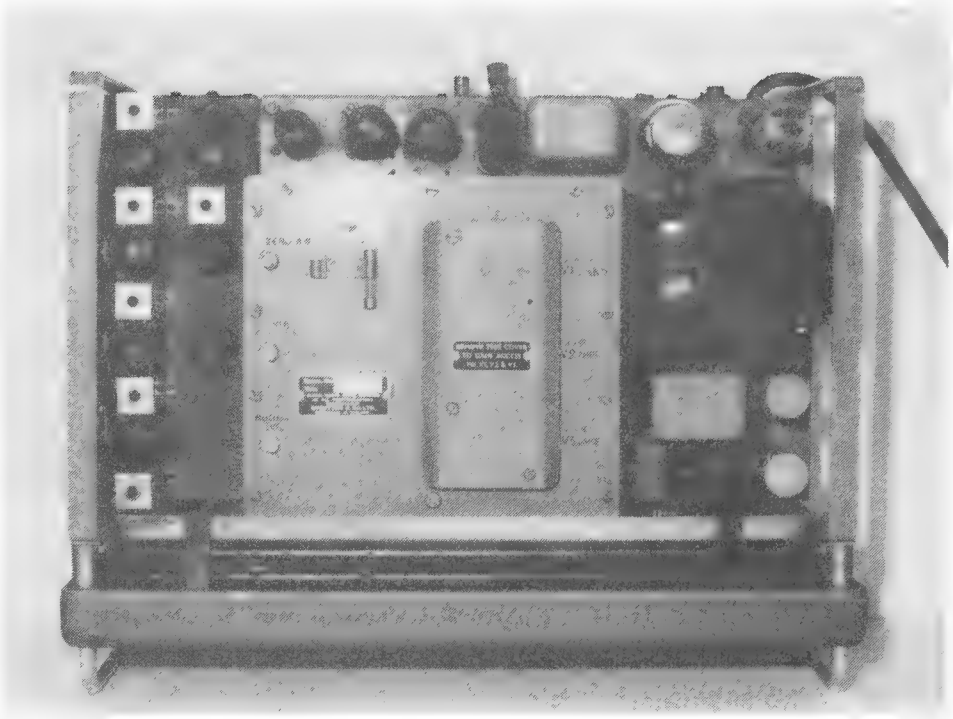
Eddystone is the brand name of the English company *Stratton and Co Ltd,* which had its origins in 1860 as a manufacturer of pins for the millinery trade. The "Eddystone" brand name was first used in 1923 for wireless components and receivers, and the company continued in supplying the amateur and public listener market until WWII. During that conflict they made thousands of transmitters, receivers and other parts, and afterwards, they concentrated on the high quality, professional communications field. In 1965, the company was purchased by the Marconi Company.

In the 1950s, the company brought out a series of receivers for the professional market and the well-heeled amateur that had a similar external appearance but different frequency ranges. The model 888A covered the six amateur bands of the era, the 770R covered the VHF range from 19 MHz to 165 MHz and the 770U covered the UHF frequencies from 150 MHz to 500 MHz. The 770R is this month's subject and the 770U will be described in a later article.

The 770R is a 19 valve, general coverage receiver designed in 1953-54, that gives continuous coverage from 19 MHz to 165 MHz in six bands. It can receive AM, FM, and CW but is not really setup for SSB. The outstanding visual feature of the set is the large horizontal dial with its smooth reduction drive, with a ratio of approximately 140:1. The front panel is a die-casting attached to a solid steel chassis, and the sheet steel case slides on, but has a lift-up lid for minor access.



Block Diagram of the Eddystone 770R.



View from the top — IF strip on left, tuning turret in centre and power supply to the right.

The receivers in this series are also similar in internal layout, with the power supply on the right (looking from the front), the RF and band- switching in the centre, and the IF and audio stages on the left side.

The block diagram shows that the antenna input at 72 ohms, unbalanced, is switched for the six different bands to tuning coils and then to the RF amplifier, the ubiquitous 6AK5. The tuning gang is three sections of 90+90 pF (split stator). The following mixer and the oscillator are also 6AK5s, and the resultant IF at 5.2 MHz goes through four IF amplifiers. The four position mode switch for CW, AM, NFM (narrow band FM), and FM (wide), loads the IF coils to vary the passband. For FM there is an FM limiter and discriminator, whilst in the AM mode the signal goes to a germanium detector diode. A BFO oscillator is switched in for CW, whilst other valves provide noise limiting and AVC, and control the S-meter for signal strength or centre tuning for FM. There is a mute amplifier to drive the 12AU7 muting stage before the audio gets to another 12AU7 push-pull driver. The audio is boosted to three watts to the 2.5 ohm speaker output by a pair of 6AM5s, also in push-pull.

The power supply is a tapped transformer allowing inputs between 110 and 250 volts and utilises a 5Z4G rectifier and a VR150/30 regulator.

The control layout on the front panel is dominated by the large straight line dial. A 0 to 100 vernier disc rotates 25 times from edge to edge of the dial, giving a scale length of 34 feet (or 10.3632 metres). The meter is at the top right and as mentioned, functions as an S-meter on AM and CW, and a centre tune meter on FM.

Below the tuning scale, on the left, there is the four position mode switch with a headphone jack below that again. Next there is an AF gain control with a Noise Limiter On/Off switch below it. Then comes the six position band switch, which has band one as the highest. Interestingly, the main dial tunes from the high end on the left to the lower frequency on the right (and they say we are "down-under"?). The tuning coils are in a turret arrangement, reminiscent of the older television tuners, and the band-switch has an arrangement to index the turret and then lock it so that the contacts are correctly aligned. The flywheel tuning knob rotates the vernier disc and moves the dial pointer across the dial. Towards the right end there is an antenna trimmer, then an IF gain control. Below these are a mains On/Off switch, a mute On/Off and a standby switch. The mute operates on all modes whilst the standby switch desensitises the receiver and also allows other equipment to be switched via an external relay.

The rear panel has, from the left, two fuses in the mains input lines; terminals for the external standby controlling relay; the antenna socket, below which are speaker output screw terminals; and over on the right are terminals for a pick-up input direct into the audio amplifiers.

Technical Specifications of the 770R are as follows:

FREQUENCY RANGE:

Band 1	114 to 165 MHz
Band 2	78 to 114 MHz
Band 3	54 to 78 MHz
Band 4	39 to 54 MHz
Band 5	27 to 39 MHz
Band 6	19 to 27 MHz

INTERMEDIATE FREQUENCY: 5.2 MHz

SENSITIVITY: better than five microvolts for 15 dB S/N ratio and 50 milliwatts output on all ranges.

SELECTIVITY:

AM and CW	-40 dB down - 50 kHz off resonance
Narrow FM	-40 dB down - 80 kHz off resonance
Wide FM	-40 dB down -175 kHz off resonance

BFO: set to 1000 Hz beat note.

FM DEVIATION:

Narrow	15 kHz
Wide	75 kHz

FREQUENCY STABILITY: less than 0.003 percent drift per degree/Celsius.

DIAL CALIBRATION: within one percent on bands one and two and within 0.5 percent on the other ranges.

MUTE SENSITIVITY: internally adjustable.

DIMENSIONS: approximately 432 by 229 by 356 mm (WHD).

WEIGHT: 25.4 kilograms (56 pounds) — so at least it is only half the weight of sets like the AR-88 and B-40!

It is interesting to compare the design philosophy of this set with, say, the AR-88. The 770R does not have an RF gain control or variable BFO, and has a fixed level of noise limiter. The provision of an IF gain control is unusual, particularly when it is suggested that it should be well advanced except in the presence of strong CW signals. I would class this receiver as a modest general purpose unit suited for monitoring VHF broadcast AM and FM signals under good conditions. In contrast, the AR-88 is a specialised receiver for digging out signals from the noise and congestion on HF that we all know and love

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Thumbnail Sketches

KENNETH CAMPBELL GUNN VK4LG/ VK4LD (SK) AOCP Laidley Qld, 1932

MW SOUND broadcasting came to the cities in the early 1920s, but most country people had to wait until the mid-30s, or post war, to have the luxury of a National or 'B' Class Commercial Broadcaster within daylight range of their receivers. In this area the amateur 'DJ' was able to provide a valuable service — and none did it better than Ken VK4LG.

From 1932 until war erupted in 1939, he entertained the rural community of the Brisbane Valley with regular programs which featured the local artists as much as possible. Sometime during the middle 30s his call sign was changed to VK4LD (presumably 4LG was given to the commercial broadcaster at Longreach, Qld). Original letters from BCLs indicate that Ken contributed to broadcast on the MW band *after* the city 200 metre amateur DJs were closed down (1935). No doubt this was possible because of the service provided and the fact that no QRM was caused to any other station.

Ken's equipment was home-brewed down to the last nut and bolt and photographs of his MW transmitter show it to be very professional in appearance. *Radio Monthly* magazine, March 1934, featured a four page story on Ken and his home-brewed rigs, including a 10 tube Superhet and the 200 metre set- up. During the mid-1930s, he was a regular contributor to *Teleradio* magazine, writing the "Hams Page."

Post-war Ken renewed his call, VK4LD, and turned his attention to SW, but his eight years given over to entertaining the residents of his local country area were his best.

SPOT THE OBLAST.

Call signs are the nucleus of amateur radio!

Barry Clarke VK5BS
17 Sycamore Avenue, Novar Gardens, SA. 5040

IT HAS BEEN traditional in the past to be able to identify the country, state and personal identification of the station with which you are communicating. It has become obvious, however, over the past few years, that call signs are *not* what they used to be. Some governments have adopted a de-regulation policy that has created chaos and havoc with the result that no longer do we know if, for example, KC6 emanates from the Pacific Island it once represented or whether it is now simply another US Government Issue.

At the other end of the scale are the little understood call signs of the USSR which, ironically, are perhaps one of the best organised systems of all, leaving no doubt as to where a particular station is located. It is so designed to indicate not only the country and the state, but the location within that state. This is identified on their QSL cards as *OBL* . . . (Nr). OBL is the abbreviation for Oblast, (which incidentally is not a Russian expletive!).

Oblast is the term used to cover the Administration Centre of an area franchised to issue call signs within that region. The nearest approximate equivalent in Australia would be our State Governments.

The are 184 oblasts throughout the entire country, all issued with a block of calls that re so arranged that the whereabouts of any station can be located with ease.

Allocation of call signs depends on whether stations are located within the areas embraced by the Russian Soviet Federal Socialist Republics (RSFSR) or the Autonomous Socialist Soviet Republic (ASSR). The methods used are quite different in both areas.

In the RSFSR, the two letter prefixes — UA, UW, etc — followed by the usual number, are the order-of-the-day, but in the ASSR the principle is the letter before and after the number that spells out the oblast.

Table 1 shows the types of prefixes and various call signs that apply to each area; eg UJ7SZ : J indicates the country, 7 the area and S identifies the oblast.

One of the slightly confusing aspects of the Russian system is the occasional use of the E-series of calls. These do not follow the normal pattern of a specific block to a call area, but are issued to stations in certain regions, cities or towns which had some significance during World War II. Consequently, they are difficult to pin-point geographically*.

The /R suffix is used by World War II veterans who have been given the necessary permission to use them. (The R stands for *Rodina* or Homeland).

As with all systems, there are a few anomalies that do not adhere to the general rules. These are either:

1 Old Timers who have been permitted the privilege of retaining their original call sign; eg UA1DZ, UH8DC, etc. (Neither of these fall within the current call structure as there is no UA1D listing.
2 Continued use of older UK prefixes by the authorities such as the Central Radio Club, Moscow, which still signs UK3A, UK3B and UK3F.

Table 1.

1st	2nd	Republic	DXCC	Examples of Call Signs
	A, N, V, W, Z	*RSFSR*	UA	UA1NAY, UZ2FWA, RA2FC, RZ3AM
			UA 9/0	UV9AX, UA0UBA, UN1BA, RA0FA
		ASSR		
U or R	B, T, Y	*Ukraine*	UB5	UB5MCI, UT4UJ, RB5IA, UB1RR
	C	*Byelo-Russia*	UC2	UC1AWZ, RC2AA, UC2DLL
	D	*Azerbaijan*	UD6	RD8DX, UD6DKW, UD7DWZ
	F	*Georgia*	UF6	RF3V, RF0FWW, UF7FWW, UF6VAQ
	G	*Armenia*	UG6	UG6GAW, RG6G
	H	*Turkoman*	UH8	UH8EA
	I	*Uzbek*	UI8	UI8ZAA, UI8TAA, UI8AA
	J	*Tadzhik*	UJ8	UJ8JA, RJ8R
	L	*Kazakh*	UL7	UL7RAO, RL8PYL
	M	*Kirghiz*	UM8	UM8ML, UM8MWO
	O	*Moldavia*	UO5	UO5OO, UO4OXV
	P	*Lithuania*	UP2	UP1BZO, UP7A
	Q	*Latvia*	UQ2	UQ1GXZ, UQ2GDQ
	R	*Estonia*	UR2	RR2RU, UR1RWX

In view of the fact that there are in excess of 100 000 amateurs currently licenced in the USSR, and these are being increased by approximately 4000 each year, it is obvious that the method of issuing call signs has to be logical as well as methodical.

Much interest has been fostered in the UK and USA over recent years in *Oblast Hunting* with regular columns appearing in magazines. Russian DXpeditioners are appearing spasmodically from rare areas such as UA8, which was recently activated.

Oblast Hunting is no easy task, but it is certainly a challenge.

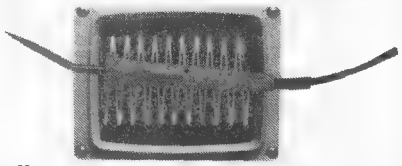
Table 2 is an alphabetical listing of all Russian Oblasts showing the necessary identifying symbols. Good Hunting!

* The author has an incomplete list of some of these call signs which may be of assistance to other attempting to relate them to their appropriate areas.

Table 2 — Oblasts of the USSR.

RSFSR				ASSR			
1A	169	6J	93	B- A	75	I-C	49
1C	136	6L	150	B-B	76	I-D	173
1N	88	6P	96	B-C	80	I-F	47
1O	113	6U	115	B-D	63	I-G	54
1P	114	6W	86	B-E	60	I-I	51
1Q	120	6X	87	B-F	70	I-L	48
1T	144	6Y	102	B-G	78	I-O	50
1W	149	8T	174	B-H	71	I-Q	185
1Z	143	8V	175	B-I	73	I-T	52
2F	125	9A	165	B-J	67	I-U	55
3A	170	9C	154	B-K	72	I-V	181
3D	142	9F	140	B-L	77	I-Z	56
3E	147	9G	141	B-M	59	J-J	40
3G	137	9H	158	B-N	57	J-K	182
3I	126	9J	162	B-P	58	J-R	42
3L	155	9K	163	B-Q	64	J-S	41
3M	168	9L	161	B-R	81	J-X	183
3N	132	9M	146	B-S	74	L-A	179
3P	160	9O	145	B-T	79	L-B	16
3Q	121	9Q	134	B-U	65	L-C	28
3R	157	9S	167	B-V	66	L-D	29
3S	151	9U	130	B-W	68	L-E	25
3T	122	9W	84	B-X	62	L-F	27
3U	123	9X	90	B-Y	82	L-G	190
3V	119	9Y	99	B-Z	69	L-I	17
3W	135	9Z	100	C-A	188	L-J	19
3X	127	0A	103	C-C	9	L-K	24
3Y	118	0B	105	C-I	8	L-L	26
3Z	117	0C	110	C-L	5	L-M	22
4A	156	0D	111	C-O	7	L-N	31
4C	152	0F	153	C-S	10	L-O	20
4F	148	0H	106	C-W	6	L-P	23
4H	133	0I	138	D-N	2	L-Q	18
4L	164	0J	112	D-D	1	L-R	178
4N	131	0K	139	D-K	3	L-T	21
4P	94	0L	107	F-F	12	L-V	30
4S	91	0O	85	F-O	15	L-Y	176
4U	92	0Q	98	F-Q	14	M-M	36
4W	95	0S	124	F-V	13	M-N	34
4Y	97	0U	166	G-G	4	M-P	177
6A	101	0W	104	H-A	191	M-Q	33
6E	109	0X	129	H-B	180	M-T	184
6H	108	0Y	159	H-E	44	O-O	39
6I	89	0Z	128	H-H	43	P-B	38
				H-W	45	Q-G	37
				H-Y	46	R-R	83
				I-A	189	T-J	187
				I-B	53	T-U	186

LOCUS TECHNICAL



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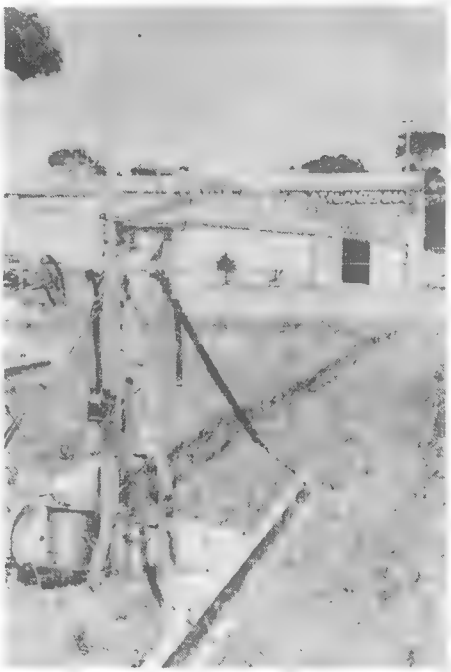
Two levels of guys are recommended at 120 degree spacing on the 8 and 16 metre point above ground. Alternatively, a bracket could be used from a building in lieu of the lower set.

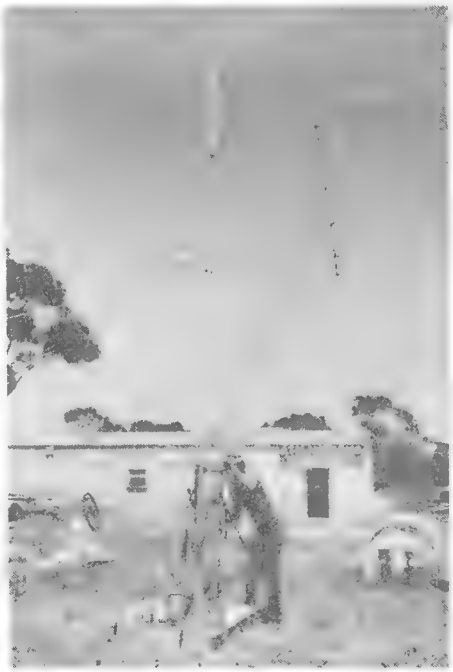
The 16.5 metre triangular towers that are 32cm across each side will be most popular with amateurs as they come complete with hinged plate, top plate with weather proofed bearing, two metres of scaffold tube masting, stainless steel hardware, assembly tool kit, galvanised base bolts and hardware, tower guy anchors, thimbles, winch steel cable pulleys and hardware for easy erection and lowering of your tower plus easy to follow assembly and installation instructions. The packaged weight is a mere 70kg.

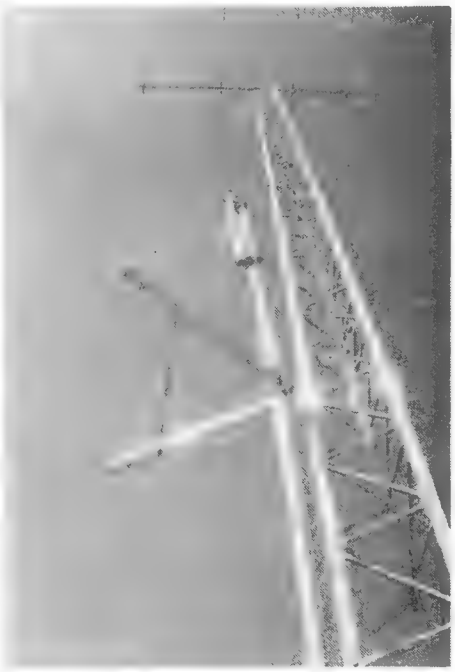
A typical installation would have the hinged base adjacent to the highest point of a house or building to which a pulley is attached. A steel cable from the winch (mounted on 1 metre of 38 mm vertical water pipe which is in the same concrete block as the base bolts) runs over the pulley and out to a point on the tower approximately 8 metres above ground. (The house is acting as a gin-pole).

This tower is self supporting and can be used without guys to support an omni-directional antenna which presents very little extra wind load, however guying with preferably Debeglass® , Dacron® or Paraphil® is mandatory with the larger beam type antennas.

These towers can handle a vertical load of 6000 kg and be made to a maximum height of 99 metres, the 16.5 metre version as with other versions have a tremendous safety factor incorporated in their design.







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SIX METRES — a band of milk and honey

Arnie Katarzynski VK4JXZ/VK4FXZ
33 Munbilla Drive, Kelso, Qld. 4815

While the HF bands have been producing only spasmodic DX openings at the bottom of the Solar Cycle, VHF operators have been enjoying a feast of activity.

The observation that low solar activity can produce better Sporadic Es has been around for a long time, and the 1985-86 season confirmed that once again. So far as this season's summer Es are concerned, it would appear that this is going to be our best season ever! But it seems that not only "Old Sol" is responsible for the fast and furious activity seen on six lately.

The latest Japanese technology has conceived a new generation of transceiver that is not only HF capable, but also VHF. The ability of these transceivers to cover an extended spectral range has given many would-be operators the opportunity to engage in six metre DX.

In the past it may not have been considered worthwhile because of the apparent prohibitive cost of purchasing the necessary equipment for a single band, now operators like myself, who start off with a combined licence, can enjoy HF and VHF with the one transceiver without the inconvenience of having an outboard transverter temporarily deny the multi-band capability, that was dearly paid for in the transceiver's purchase price.

Competitive pricing of multi-band and single-band six metre rigs in Australia has also enticed many newcomers onto six.

Recent inquiries made show the FM module "option" of a well-known brand of six metre transceiver is selling at nearly twice the price on the Japanese domestic market than here in Australia. The same seems to be true of the rigs themselves, as the Japanese manufacturers try to stay competitive on a world market that is under immense pressure from an ever rising Japanese Yen.

But when it's all said and done it's the lure of DX that is now bringing more and more operators onto six. Most of the activity observed has been on 52.050 MHz, the Oceania SSB calling frequency. It seems that the FM mode is not being supported as much as in past years but the emergence of new FM repeaters in Sydney and Gladstone may help to change that.

Observations made since June 1984, from my home QTH of Townsville, have shown that most of the SSB activity has occurred from August to the end of May each year. August, September and October are the months centred on the Spring Equinox and in most years have brought a reasonable level of trans-equatorial propagation (TEP). This was not the case in 1984 and 1985 when very few contacts were made on this mode to the northern Pacific area. Activity this year was much better and the number of openings in this season alone have outnumbered 84/85 combined.

March, April and May brings the Autumn Equinox, regarded by some as the better of the two. 1985 saw three solid openings in March and April while this year brought only patchy openings that the keenest of observers used to their advantage.

During the middle of the year, the band entered the deep solar winter with no contacts at all for three months and only one VK2 opening for the entire period from 26/4 to 11/9. During that time, it seemed that amateur radio would never be the same again since even the HF bands offered no DX to escape this dreaded solar pattern. But the 24/8 gave us hope of activity, when at 0850 UTC, a weak carrier emerged on 49.750 MHz and I have never been so pleased to hear a signal emanating from Russia.

Nevertheless, it was a long wait, as nothing developed out of this until the 12/9 when a fine opening occurred and I worked 13 JAs from 0755 to 0825 UTC. Lloyd VK4FXX, and I pounded the band from JA1 to JA7 with about 400 watts ERP and gave the JAs another parcel of QSLs to send to Australia.

Although the Russian television was audible most nights no further opening occurred until the 22/10 when the band opened to JA4, 5 and 6. Meanwhile, the Es season had begun on the 10/10 and we found ourselves trying to monitor to the north and south at the same time on three different parts of the band, plus beacons. In this situation the shack begins to swell as the need for more equipment grows and you find yourself converting CBs to six metres, trying to cope with the band's seemingly endless DX possibilities!

As the Russian television became weaker each night and no further JAs were heard, and interest centered on Sporadic E. October proved to be full of pleasant surprises when the band opened on six occasions to VK2, 5 and 8. Compared to the previous two years this was about one month early and it was reasonable to expect that this would be a bumper season.

With November 6 came an early opening to VK7. It's normally a difficult call area to work on six. The month was in general excellent with an opening every three days, but signal strengths were way down and for a while it appeared that the band was suffering from "one-way-itis." In reality, polarisation favoured the vertical mode.

December however, stole the show completely. On the first day of the month there was a three hour opening to P29. Four stations were worked, but again the signals were in the mud. The next day the band behaved as the six metres of old, with a fine opening into VK1, 2, 3, 5 and 7 lasting ten hours — late into the night. At last the needle was bent and I didn't have to build that pre-amplifier after all!

The climax occurred on the 5/12 with the band open almost continuously from the 28/11. There was an early start to the day when at 2115 UTC the band opened to VK2, half an hour later to ZL2 and 3 with colour pictures from ZL-TV 1 fading in and out. I took the IC-505 to work with me and monitored occasionally. Surprisingly the band didn't take its usual midday dive, and intensified during the day. A mad rush home after five and I found that things were "hotting up" with every beacon to the south audible.

Minutes later I discovered the VK0 beacon keying away at 5x5 and a small dogpile of phone and CW stations trying their luck at an unresponsive keyer. Lloyd was in my shack at the time and we were discussing the events, when Sojo VK0SJ, suddenly came up on phone. Lloyd turned into a greyhound and broke the hundred metre dash record to his shack.

The result of course is well-known. Four VK4s made the contact that afternoon with John VK4FNQ, being the longest haul from Cairns. In the following hours I made contact with VK2, 3, 4, 5 and 7. It occurred to me that there now existed the possibility of setting a new Australian record for working all States and call areas in a short period of say, 24 hours. If that could be achieved, it would be in the six metre record books for a very long time. Now the hunt was on.

At 0957 UTC, I worked VK1BUC, but couldn't get a report as the band was too weak. The rest of the night only produced more VK2s. The next morning however, I had another contact with VK1BUC and exchanged reports of 5x9. At 0209 UTC, VK8ZMA called and was also 5x9. Things looked promising for that VK6 contact and at 0300 UTC. I heard VK6BE on CW at 5x1. I had never been so nervous on the key since my last CW examination but completed the contact.

This left only VK9 to get — and about three hours to do it in — if I was to complete the attempt in the 24 hours. To my knowledge there were no operators on any of the islands except maybe Willis Island. A call to the Brisbane Weather Bureau gave me the direct dial telephone number, using AUSSAT.

All hope faded as Willis Island personnel told me that I had called at an inconvenient time and they could not assist. Next week would be fine if I rang back. I had made the request during their busiest period when the bi-annual supply ship had arrived and no hands could be spared.

Nevertheless, it was great fun trying and experiencing the trials and tribulations of a very fascinating band. Now all ears are on the Pacific area as we in North Queensland try to contact VK4ZNC on his journey to various tropical locations. I can't wait for that first faint signal.

ar

DXCC JUBILEE

At midnight UTC on New Year's Eve, the DX bands exploded with activity as award hunters began the quest to work 100 DXCC countries during 1987.

Rules for the award are simple, any mode and band (except 10 MHz) may be used for contacts, and no QSL cards are required — just a log extract showing call sign, country, date, band, and certified by the applicant to be correct. An attractive certificate will be sent to each qualifier. The application fees is $US5 or 12 IRCs.

A special application form (MCS-555), available from ARRL Headquarters makes the application process painless and foolproof.

When the DXCC award was first announced in 1937, there were five charter members — and it had taken each of them several years to accumulate their country totals. How long will it take to duplicate their feat 50 years later, at the bottom of the sunspot cycle.

—*The ARRL Letter,* December 23 1986

PETITION FOR LABELS

THE WASHINGTON LEGAL foundation, a national public interest law firm, has filed a petition that would require manufacturers of cellular telephones to put warning labels on them. The labels would state that the communications over the phones are not private. The Foundation noted that cellular calls can be received by many scanners and television sets, and that such warning labels are already required on cordless phones.

—*The ARRL Letter,* December 23 1986

1986 STATUS REPORT OF EME IN THE USSR

Following is an extract from the column *VHF*UHF*SHF* of S Bubennikov, appearing in the Russian journal *Radio* No 09 of 1986. The translation from the original Russian in *Radio* was by Dexter Anderson W4KM, and his work is hereby acknowledged.

There appears to be a good level of activity in the USSR on this rather exotic mode of propagation but it is interesting to note the complete absence of any stations from countries in IARU Region III being worked by the Soviets. Perhaps the moon "window" was unsuitable or maybe interest within our Region has disappeared.

If that is so, what a pity because it may well be that "moonbounce" originated within our Region. A recent "Looking Back" article in *Break In* (September 1986, Page 19) briefly described the (unsuccessful) attempts of one Stuart Kingan, then ZL3GD, to "bounce' a five metre signal off the moon in 1935/36. By today's standards the equipment was very crude indeed but the point remains that the idea and the initiative to exploit the idea was around — in 1935.

EME

The possibility of using the moon as a passive repeater for terrestrial super-DX radio communication was demonstrated in a practical way over a third of a century ago. A series of research experiments were carried out, and a project was even proposed for creating a world-wide television system.

In the 70s, the moon began to be used as a passive reflector. At first 144 and 430 MHz were used, then 1215 MHz and higher-frequency bands. In the early period, at least one of the two stations used professional gear, principally antennas. Later radio amateurs made their own equipment that overcame fading on the path Earth-Moon-Earth, equal to 253 dB on 144 MHz and 262 dB on 430 MHz. . .

The most intensive operation involving new EME QSOs takes place during the two-round (Fall and Spring) ARRL EME Contest.

The first EME QSOs in our country were made in May 1979 by UK2BAS operators in the 430 MHz band. In 1981, the following almost simultaneously logged "Moon" QSOs on 144 MHz: UT5DL, UA3TCF, UB5JIN, UA3LBO, UA1ZCL, UG6AD, UD6DFD.

Last Fall several of our stations had their first Moon communications on 144 MHz all at once. RA6AX (ex-UA6YB), from Belorechensk, had 30 QSOs with 12 stations beginning October 1985, and ending at the end of March 1986. His neighbour, RA6AAB (ex-UA6YAF), worked nine stations during the same period, and UA6BAC, from Novorossiysk, made his first EME QSO with W5UN. The operators at UZ6LXN, in Taganrog, have had three contacts. UA6BDC, from Yeysk, has worked over 20 stations.

UY5OE and RB5LGX, from Khar'kov, had their first EME contacts in December 1985. By March 1986, RB5LGX had made 22 QSOs and UY5OE 11.

RB5LGX reported that in March, "Moon" signals from KB8RQ, were monitored by his neighbors RB5AO, RB5AL, RB5EU, UY5DE.

UA0WAN, has shown up in Siberia — from Chernogorsk, Khakasskaya Autonomous Oblast. He wrote that on November 2, 1985 he pointed his 8x9 element antenna toward the Moon and immediately heard DX stations. He finally gave a call and got an answer right away from KB8RQ, then worked WA1JXN/7, DL8DAT, W5UN, UA1ZCL, YU3WV, and F6BSJ.

RL7GD, from Alma-Ata, heard KB8RQ and W5UN, in the Fall contest. RL7GD recorded W5UN's loud signals on a tape recorder for a demonstration to ultra- shortwavers of his area.

RA3LE, after a break, has resumed operating via the moon. He is now able to work DL9KR on SSB; by the way only UA6LGH, from Taganrog, and UA3TCF, from Gor'kovskaya Oblast have thus far been able to work DL9KR.

RA3LE notes that on 144 MHz particularly strong signals come from W5UN and KB8RQ from the USA and from DL9KR and DF3RU from the FRG — coming through in a bandwidth of 3 kHz at a level of 13 to 20 dB. If these pairs are on, it's hard to work other stations. On February 22-23, and April 19-20, 1986, RA3LE was on the air for about 26 hours, making 69 QSOs with 44 stations (UA1ZCL, RA3YCR, UG6AD, UA6YAF, UA3TCF from the USSR), of which 26 were new ones for him. On 144 MHz they included DJ7UD, DK9IP, HG1YA, SM5DRV, YU7AA, WA1JXN/C6A, WA1JXN/7, and DK2PH, and on 430 MHz SM0DYE, OZ7VHF, W0SD, N4GJV, G3SEK, G3LGR, F1ELL, and YU1AW. RA3LE monitored two signals from RA3YCR from Bryansk: One was coming through via the troposphere and the other by reflection from the moon. They were separated in frequency by 0.4 kHz and in time by 2.5 seconds.

UA9FAD, from Perm', is active in communication via the moon. The Fall contest brought him 23 stations, four of them new. For the first time in two years of operation he noted, on November 3, 1985, an effect in which the troposphere acted as a collecting lens (sobirayushchaya linza) of signals reflected from the moon, and in which fading on the propagation path decreased abnormally. As the moon was setting at the end of the contact with F6CJG at 0904 UTC, the received signal strengthened noticeably. Then UA9FAD heard a loud CQ from YU2PV. At 0920 UTC they signed. He quickly worked OK1MS who called him. UA9FAD heard his own echo at +12 dB. He couldn't finish the next QSO with I1RSQ because the moon went behind the horizon. For the Spring contest, UA9FAD installed a new preamplifier for two bands using KP320 transistors, enabling him to receive solar noise 1 dB louder on 144 MHz and 4 dB louder on 430 MHz. The addition of 1 dB brought him 31 QSOs, bringing his total of EME stations to 77! He hasn't yet transmitted on 430 MHz.

UA1ZCL, from Tumannyy, Murmanskaya oblast, had, by Spring 1986, had new contacts with N4AR, EA2LU, WA4LIT, WB0YZN, SM5GEL, SM0DJW, W7FN, YU3PV, K3GAU, WB0QMN, WA1VTA, KF0M, W0RWH, SM2CEW, UA6YB, RB5LGX, UY5OE, DJ5AR, G3LTF, UA0WAN, NP4X. The last two gave him two new squares for a total of 35. In the Spring, UA1ZCL rebuilt his antenna and was able to receive solar noise 2 dB louder. After this he was able to have 80 QSOs, among them LA2AB, PA3COB, W4ZD, WB2NPE, DK5LA, DL2LAH, YU7AA, LZ2US, FD1FHI, OK2PZW, OK2VMD, OH5LK, EA3DXU, WA1DJG, SM4KYN, F6DRO, LZ1KPG, PA3CSG, F1ANQ, HB9CRQ, WA3DJG. UA1ZCL has now worked 263 EME stations.

UA6AD, from Yerevan, using a new four by 16-element antenna, had 60 QSOs with 33 stations on five continents from February through April of 1986. Included were UA1ZCL, RA3LE, UA9FAD, HG6DX, ZS6ALE.

Contributed by David Rankin 9V1RH/VK3QV

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Novice Notes

SOME TROUBLESHOOTING TIPS

Drew Diamond VK3XU
Lot 2, Gatters Road, Wonga Park, Vic. 3115

What do you do when a fault occurs on one of your favourite items of equipment? Do you send it to the place where you bought it, or contemplate having a go at fixing it yourself? A glance at the circuit would probably cause most of us to adopt the former approach. It is possible however, for the amateur to make a successful attempt at repairing even complex equipment if a logical approach is adopted. Whole books (see bibliography) have been written about electronic troubleshooting and repair methods, and it is beyond the scope of this article to present anything like a full treatment of the subject. What I would like to do though, is to relate a few of the most useful trade secrets — things that I learned during nine years at the electronic service bench.

Obviously, a full understanding of how a piece of equipment operates will greatly assist in any troubleshooting job, and if time and resources can be spent on this, then fine, but often, for various reasons, this may not be feasible or economically possible. It may even be necessary to start without so much as a circuit diagram for instance.

Most faults can be firstly divided into two primary categories; solid (there all the time), and intermittent (comes and goes, or when the unit is hot or cold). A further sub-division into "worked before" or "never worked" may also be made. A device that has worked satisfactorily, and is now faulty will probably be found to have a component failure, whereas a device that has never worked: eg a home-brewed project, must be approached rather differently, as the problem could be due to incorrect component(s) installed, wrong polarities, wiring error, incorrectly marked components (I have seen diodes with the cathode marked at the wrong end!), or — Heaven forbid; design error.

At this point let me sound a cautionary note; when working on equipment where high voltages are used, always have another responsible person in your vicinity and make sure they know where the mains switch is. If you are inexperienced in high voltage work; seek the guidance of someone who is experienced. The potentials used in much amateur equipment ***CAN KILL,*** or cause serious burns. Switch off and remove the power plug from the mains socket when changing fuses, soldering and so on, and make sure that all filter capacitors have discharged to a safe level.

Contrary to popular belief, the easiest fault to trace is often the catastrophic one, ie blows a fuse very quickly. Examine the fuse. Is the glass completely blackened? This sort of effect is usually produced by a "dead short." Check the power supply rectifier diodes, filter capacitors and any other accessible passive components in the power supply area. If these appear okay, try to remove all loads from the secondaries of the power transformer, and, with a new fuse installed; apply power. If the fuse still blows, the transformer is probably faulty, but check the capacitors in a mains filter if fitted.

A fuse which blows 'quietly' ie after a period of time from power-on may be more difficult to locate. You could have a leaky diode or filter capacitor, or shorted turns in the power transformer (does it get hot and make a 'brown smell'?).

Much of the basic test equipment required we carry around with us all the time, that is; our eyes, ears, nose and fingers. Visually check for broken wires, loose connectors, signs of charring, smoke stains, leaked substances (eg wax. Beware of any oily substances — particularly in old equipment as they could contain very toxic polychlorinated bi-phenyls. Do not touch the substance, and no further work should be attempted on such equipment).

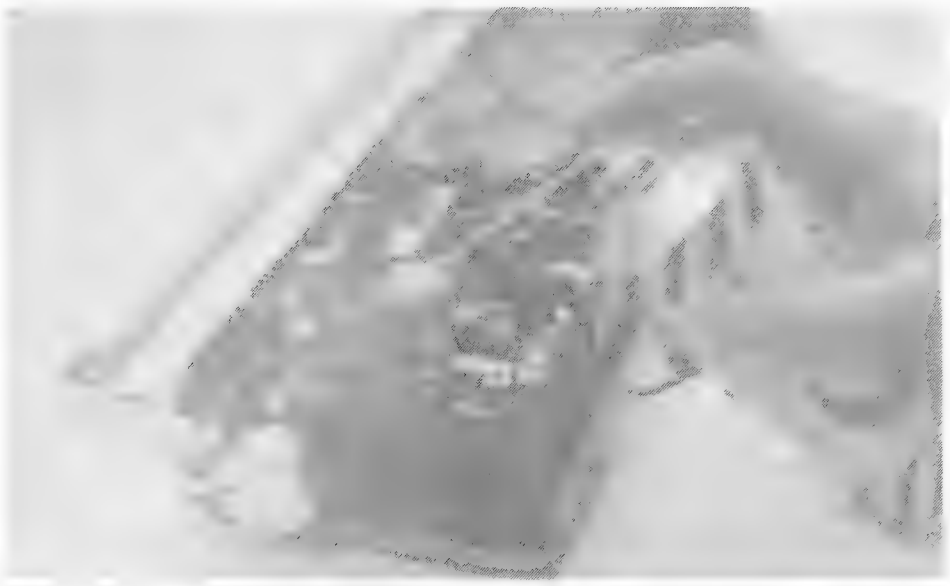
It is probably safe to say that the majority of faults occur in the power supply or power output stage of any equipment. This is because of the stresses caused by the voltage, current and heat levels involved. In addition, any circuitry where the equipment interfaces to the outside world through inputs and outputs, show a marked vulnerability to damage from external sources.

Always approach any problem with an open mind. Test the effectiveness of every control (sometimes called "milking the front panel") to determine what circuit functions are effected. For example; does the background hiss of a receiver change in level as the volume control is rotated? Does rotation of the bandswitch cause audible clicks? Can the crystal calibrator be tuned in, on the spot expected? and so on. In other words, valuable time could be wasted checking the RF amplifier only to find that the voice coil of the speaker was open!

If you are fortunate in having a circuit with voltages indicated (bliss); then measure these around the suspected area. Be very careful not to let the probe tip slip whilst making measurements. Few things are more infuriating in a repair job than to cause more problems than we had when the job was started — and don't blame Murphy — most problems of this kind are due to plain carelessness. A voltage which is significantly different from that indicated could mean you are getting close to the problem. Remember to keep in mind any effects that probing with your multimeter might have on the circuit. If in doubt; use a high impedance meter such as a DVM if one is available to you.

No matter what the fault may be, it is a good plan to begin any job by measuring the supply rails. These could be +12V, -12V, +5V for instance. If any of these are absent or out of tolerance, this problem should be tackled first. Sometimes a shorted component such as a bypass capacitor will pull a rail down, making it appear as if that supply rail is not working, when in fact it has simply gone into the current limit mode. If possible, isolate items which are sourced from this supply one at a time, until the faulty area or board is located. If no visible signs exist; it should be possible to pinpoint the problem with ohm meter checks, lifting off one lead of suspected components, one at a time. A meter which can measure low values of resistance with resolution will be found useful in tracking a short on a supply rail, as the reading with respect to common (usually earth) will decrease as you get closer to the short.

Intermittent faults can be very frustrating, although one or two helpful techniques are available to us. An intermittent problem which responds to a mechanical stimulus, by rocking or vibration, can usually be located by careful probing in the suspected area with an insulated prod. A knitting needle is ideal for this. Gently probe, push and pull the various components, particularly connectors, or socketed devices, and observe the effects. A fault can usually be very quickly located in this manner. Sometimes we must tackle intermittent faults where the effect of our probing is not readily perceived. For example, troubleshooting an S-meter circuit. So that we may concentrate our eyes upon the probe; it is possible, provided that no high voltages exist, to attach an AF amplifier —



AC coupled via high impedance probe, to the "live" side of the output area of the circuit under investigation. In this case, one side of the S-meter coil. We can now *listen* to the effect of our probings. This is a very handy technique, and has been of use to me on hundreds of occasions — even some involving digital circuitry, by listening to the change in sound produced in a bit stream for instance.

A significant number of problems may be described as "temperature sensitive." For example; as the device warms up the fault appears, or the converse may occur. Two very powerful tools are available to us; the "instant freeze" can, and our soldering iron (see photo 1). Most electronic shops stock cans of instant freeze. This fluid needs care in its application. It must not be furiously applied in a haphazard manner, but rather, should be gently sprayed sparingly onto suspected components, one at a time (see photo 2). Noisy semiconductors, resistors, leaky capacitors, and marginal connections generally respond very well to this treatment, as the suddenly cooled component is stressed by the cooling action, and the fault will cycle.

A soldering iron may be used to apply heat to suspected components. The tip must not be directly applied for obvious reasons. A length of teflon tape (the kind used for plumbing) may be folded several times to make a buffering device, and held between the iron tip and the component (see photo 3). The heating effect so obtained may be just what is required to stimulate a faulty P-N junction into going open or short (or frantically noisy), a resistor to go open/noisy, an IC to stop functioning and so on.

A great degree of care must be exercised when applying the heat/cold treatment, as any electronic device will malfunction if it is too hot or cold, so we must be prudent about how much is applied. If the fault has been occurring at or near ambient temperature; then clearly, not significantly greater or lower temperature will be required to cycle the fault.

A can of freon will be found handy around the workshop. Noisy potentiometers can be easily cleaned by squirting a small amount into the pot and the shaft quickly rotated several times and allowing the dirt-laden fluid to run out. Noisy switch contacts usually respond to a quick spray whilst the switch is operated through its range. Freon is also useful as a mild coolant as well as a cleaning and degreasing agent. Take care with some plastic materials however, as freon may react.

The ordinary analogue or digital multimeter must be just about the handiest item about the shack. Apart from the well-known functions of voltage, current and resistance measurement; our multimeter can be used to check diodes, transistors, most FETs, SCRs, capacitors and power transformers. It must be remembered that most meters have a positive potential on the black lead when measuring resistance in the ohms mode. So, when a diode junction is to be checked, the black lead (+) would be applied to the anode and the red lead to the cathode for forward conduction. On ohms X1, about 20 ohms would be about normal for a silicon junction. Reversing the leads should indicate an open. Any silicon diode which does not show infinite resistance in the reverse direction is faulty and should be replaced.

Transistors can be checked in a similar manner, but now we have two P-N junctions to deal with. For an NPN transistor, the black lead (+) would be connected to the base, and the red lead to the emitter and collector in turn. It will be noted that for a good transistor, about 20 ohms (depending on the meter) will be read, with the B-C junction just slightly lower in resistance than the B-E junction. Reversing the leads and going to ohms X1000 should indicate an open for both junctions. Once again; any silicon junction which is not infinite in the reverse direction is suspect. Some idea of leakage can be obtained by connecting the black lead (NPN) to the collector, and the red lead to the emitter with the meter on ohms X1000. A very high resistance reading should be obtained.

Capacitors larger than about 0.01 uF can be given a functional check by first disconnecting one lead, and connecting the meter set to ohms X1000 for small capacitors, X1 for very large capacitors, and observing the upward kick of the meter needle as the capacitor charges. Reversing the leads should produce a stronger kick, finally settling back to infinite for small non-polarised capacitors, megohms for electrolytics. The polarity of the voltage source — in this case our multimeter on ohms, must be correct for the final reading on polarised capacitors.

Inductors and transformers used at power frequencies may also be given a preliminary check with our multimeter set to ohms X1. The meter leads are first applied to the winding and the resistance read (some circuits do indicate the DC resistance to be expected). Now the leads may be reversed. For a good winding it should be observed that the needle moves off the stop very sluggishly, and crawls to the final resistance reading previously noted (the residual magnetism in the core, by Lenz's Law, opposes the setting up of the new field polarity). Smaller transformers and inductors like IF transformers, interstage transformers etc may be checked for simple continuity on ohms X1.

CONCLUSION

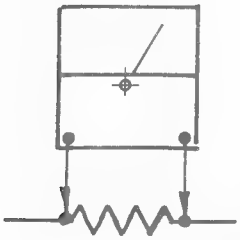
This has been a very brief treatment of an interesting subject. Unfortunately, there is just so much that can be imparted by words alone, because troubleshooting is a very practical pursuit, so skill and speed must be obtained by 'hands-on' work. Any opportunity therefore, to gain experience should be taken up if possible. Domestic radios, cassette players etc are so cheap these days that many people just throw them away when something goes wrong, and these items would provide a rich harvest of valuable experience for anyone wishing to improve his or her skills.

SOME FURTHER READING

Radio Servicing Pocket Book — Capel. Newnes Butterworth ISBN 0408001445.
Radio & Electronic Laboratory Handbook — Scroggie. Newnes Butterworth ISBN 040800373.

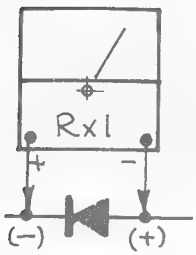
Handbook of Solid-State Troubleshooting — Gardner. Reston ISBN 0879093390.
Tested Electronics Troubleshooting Methods — Buchsbaum. Prentice-Hall ISBN 0139069585.
Advanced Electronic Troubleshooting — Cameron. Reston ISBN 0879090022.
Digital Troubleshooting — Gasperini. Movonics TM101.
Techniques of Digital Troubleshooting — Hewlett Packard Note 163-1.
"Finding Those Faults." ETI Magazine. March. '86.
Practical Wireless Fault Finding Guide. PW Magazine April. '76.
Power Supply Servicing. Ham Radio Magazine. (USA) November. '76.
Fault Finding. Practical Electronics Magazine. (UK) January. '78.

USING YOUR MULTIMETER TO CHECK SOME COMMON COMPONENTS



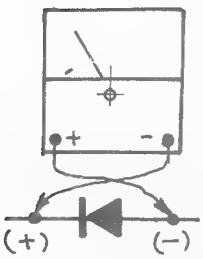
RESISTANCE

Check resistance directly.

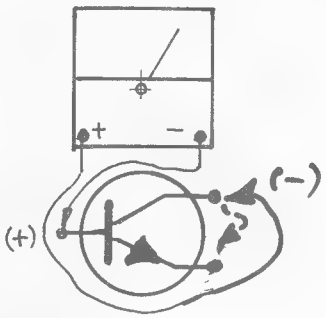


DIODES

1. Low forward reading of about 20 ohms for silicon and 10 ohms for germanium (remember, on most multimeters the red lead is negative when in ohms).

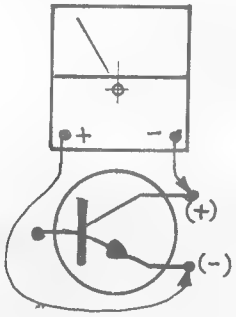


2. High resistance reading. Infinite for silicon, about 100k for germanium.

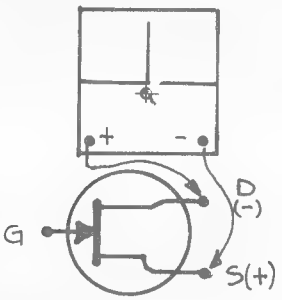


TRANSISTORS

1. Low forward reading of about 20 ohms for silicon, 10 ohms for germanium, from base to emitter, slightly lower from base to collector (about 19.5 ohms).
PNP: Polarities reversed.

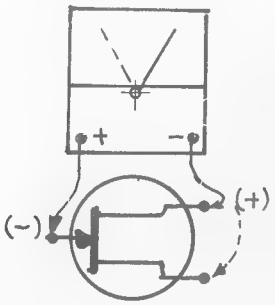


2. Leakage: Good silicon transistors should be near infinite.
PNP: Polarities reversed.

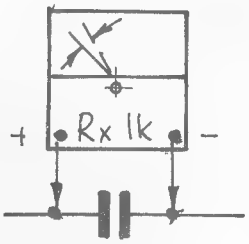


JUNCTION FETs

1. Drain-source: Tens of ohms to hundreds of ohms. Same in both directions.

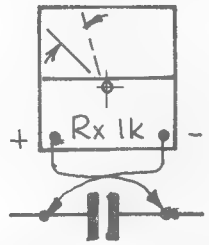


2. N-Chan. Low forward reading. Reverse leads: Infinite reading (diode effect).

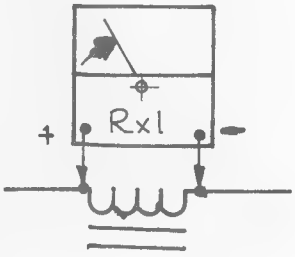


CAPACITORS greater than about 0.01 uF (good or bad).

1. Charge: Connect leads and observe upward kick.



2. Discharge/charge: Reverse leads and observe larger upward kick. No residual reading for good capacitors.



INDUCTORS (Applies to inductors used at audio frequencies; eg power transformer).

Observe sluggish deflection to final resistance reading. Reverse leads, and needle should be even more sluggish due to residual magnetism in core and inductance. An inductor with shorted turns will not have these characteristics.

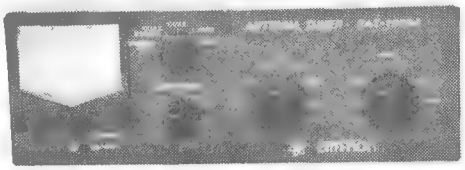
SYDNEY — MELBOURNE — BRISBANE

NEW

1000 WATT TUNER
EAT — 1000A

PRICE $499
PLUS $15 delivery

YOU HAVE ASKED FOR IT — WE HAVE MADE IT!



This new EAT-1000/A is EMTRON'S latest antenna tuner built on special request by many amateurs. Built with finest components available, 5 position internal antenna switch, cross needle SWR/power meter, built in 4:1 balun for open feedline and antenna terminals for coax line, open feedline aswell as longwire. EAT-1000A will tune almost everything from 1.8 to 30 MHz. At lowest price, professional design and quality that EMTRON provides.
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Antenna Tuner & Low Noise Amplifier For Receivers!

ETP-1 will match your antenna to your receiver for maximum signal from MW to SW. It utilizes a low noise 12dB gain preamplifier to boost weak signals. Special spring loaded long wire terminals as well as SO239 connectors make ETP-1 the most versatile tuner/amplifier on the market

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Yes this new from EMTRON — highly accurate CROSS-NEEDLE SWR & POWER meter, model EP-200 with a freq range from 1.8 MHz to 60 MHz and two power ranges 20, 200 watts, gives instantaneous readings of forward/reverse power and SWR

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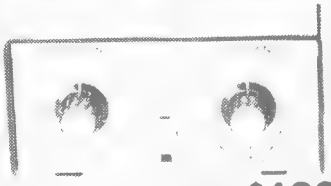

Professionally made noise bridge for all kinds of RF measurements antena adj etc

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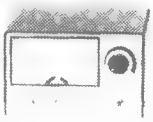
EMTRON'S NEW HF SWR METER EP-1



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Specially designed for SWL. Based on the famous "DRESSLER DESIGN", the unique electronic circuitry gives to receiver a perfect impedance match from 100kHz to 30MHz. A 12 dB low noise pre-amplifier gives weak signals a boost comes complete with 240V AC 12V DL supply and 10M of coax

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P.O. Box K21 Haymarket, NSW 2000
Ph: (02) 211 0988
FAX: (02) 281 1588

VICTORIA:
288-294 Queen St, Melbourne
Vic. 3000
Entrance from Lt. Lonsdale St.)
Ph: (03) 67 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:
416 Logan Road, Stones Corner
Qld. 4120. TLX:144696
Ph: (07) 394 2555
FAX: (07) 397 3531

How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

SAVED MARCH

The ARRL 1986 National Convention, held in San Diego, placed an item on the agenda that was so successful it will become an annual event.

The event was a Youth Forum, attended by 150 enthusiasts, consisting of five panelists of notable names including Dr Anthony "Tony" England W0ORE, Gordon West WB6NOA, a well-known teacher and technical writer, Jerry Boyd KG6LF, Chief of Police for the City of Coronado in California, teenager Scott Springate N7DDM, a Contributing Editor for *QST*, and Harold Price NK6K, a computer communications consultant who has an avid interest in amateur satellites.

It was interesting to read the report of how some of these amateurs began their hobby and their general remarks. Interesting was Gordon's question to the gathering; "What was the hardest part of getting your amateur licence?" Some answered "the code", others "the technical part." Gordon accepted neither answer. His answer: "Getting to your first class lesson."

Scott was licenced at the age of 11, through the help of a local amateur. He wrote to *QST* complaining there was nothing in the magazine to attract or interest young people. You guessed it, he got the job!

Jerry, an enforcer of law and order, feels that amateur radio helps a person in three ways — Friendship, Public Service and Career Guidance. Jerry stated that he got started and progressed in his career because of the hobby. He said that no matter what field you choose today, communications and electronics are an integral part of it — insurance, teaching, banking or being a doctor — it doesn't matter what field. If you have the kind of background the hobby gives you, you will do well.

Tony became interested around the age of 13, when he frequented an amateur radio store in Fargo, South Dakota. Other amateurs frequented the store too and he learned a lot from them. He got his licence and bought an old receiver, and his pals helped him build a simple transmitter. Tony said; "I was always building junk and most of it didn't work, but I learned a lot doing it."

PERSONAL THOUGHTS

If anyone has got this far they are probably asking themselves what this has to do with DXing. As a columnist and dedicated to the hobby, I feel it has a lot to do with it as, where are our DXers and amateurs of the future going to come from? Are we going out and seeking to introduce the younger generation to a different form of electronics than what they are accustomed to in a pinball machine? Are we being selfish by not going into the schools at primary level and introducing the "magic" of a worthwhile and rewarding hobby? I feel we are and if we don't do something positive in the immediate future, by the turn of the century, there will be few VKs who are DXers, or for that matter, amateurs! This matter should immediately be brought to the attention of your Division, so that it may be discussed at the next Federal Convention, to formulate a plan for recruiting, before the hobby as we know it becomes extinct.

HELP WANTED

A note from Ted K1BV, a well-known DXer and award hunter, requests help in preparing an up-to-date Awards Directory. Ted now has some 300 awards on his computer listing and would like details of national, state and club awards.

Tom emphatically notes that this is not a commercial venture as he feels awards are an important part of the hobby and wants to see more promulgated with their rules.

Award custodians, please assist our friend as this will help all who are interested in this facet of the hobby.

Information should be forwarded to Ted Melinosky K1BV, 525 Foster Street, Windsor, CT 06074, USA.

SILENT KEYS

It is sad to relate that Joy VK2EBX, an avid DXer and consistent contributor to this column, lost her son, Will VK2VJC, in a freak accident on December 22, 1986 at the age of 33. Joy also lost another son aged 20, six years ago. Sincere condolences Joy, to you and your family on such a tragic loss.

Well-known DXers, Shri VU2VG and Roy G3JEQ, became silent keys late last year. Sincere condolences to both families from all their amateur friends.

SWAZILAND

Gertjan PA3CPG, hopes to be signing 3D6. . until August this year, if he can procure the correct authorisation. Here's hoping!

DISAPPOINTMENT

After being within 80 kilometres of his objective, Bob KD7P, was a disappointed man when his mission was aborted due to only one helicopter being operational on the vessel. The captain could not take the risk of using it to place Bob on Peter I Island. If there were any hitches or another breakdown it could have been catastrophic. Bad luck Bob, better luck next time! In the meantime, it is hoped you have many QSOs with the call sign, KC4USR, from Antarctica.

POLICE ASSOCIATION

Members of the *International Police Association* are scheduled to be presently operating from Saint Martin using the call FS51PA.

SWEDEN

A special call, for prefix hunters, will be used by a handful of Swedish operators towards the end of this year. The call will be 7S#FRO. Reason is unknown at present.

AVES ISLAND

Martha and Carl Henson WN4FVU and WB4ZNH, have been invited to join the 4M0ARV DXpedition, scheduled for this month. If they accept watch for some slick operating from this duo and the rest of the group. It may be a new YL country for many, too.

ISRAEL

The restructuring of the Israel call signs will be along the following lines. Novices will be issued with call signs in the 4Z9AAA-4Z9ZZZ bracket. Grade B (full frequency privileges with 150 watts maximum output) will keep their present 4X4, 4Z4 and 4X6 prefixes. Grade A, entitling holders to all privileges, plus 1500 watts output, will change to a 4X1 prefix.

Israeli amateurs will again be operating special event stations over Easter. This year, instead of the usual two, there will be five operating from historical and biblical sites including Bethlehem, Jerusalem, Nazareth, Mount Tabor and Mount Beatitudes. All operations will be under the auspices of the Israel Amateur Radio Club and it is believed that special cards will be available.

SOUTH SHETLAND ISLANDS

Dan VK1ST, was advised in a contact with CX4AS that CX0XY will be operating from the Islands until this month. The Chilean station 3G9SBY, will be on-air from the same QTH.

Dan has had some good contacts, including one with BY4AA, who is running an IC-750, plus linear of 200 watts, to a seven element Yagi on 20 metres. Other contacts include EA8TE, VQ9HW, DP0GVN and VK0DA, with his KWM2A, 30L1 and TH3 Mk3 at 10 metres above "terra firma."

LARGE ANTENNA

Tom K1JJ, has constructed the antenna to beat allcomers on 80 metres. The horizontal Yagi antenna has 11 elements, each 33.5 metres long on a 91 metres boom. Each element is supported by a 18 metre mast and is fed by a quarter-wave stub controlled by a remotely controlled tuning capacitor. The forward lobe may be reversed instantaneously by the use of 11 relays.

BELGIUM

A note from Jane ON7WW relates that the bands are very quiet in that area and the only contact of interest to be logged is 5A0A. Jane's OM, John, needs only one more CW contact for the Honour Roll. Congratulations John.

BITS AND PIECES

The **South African Government** are planning to build a large airport on **Marion Island, ZS8.** What plans are afoot? ** **Fernando CE0ZIP** will be visiting VK1 on a Trade Mission this year. ** **Craig VK9XW** after 20 years, has left **Christmas Island.** ** **4K1F** is operating from the USSR base of **Bellingshausen** in the **South Shetland Islands.** ** **7P8BE** was **George VE3FXT** operating out of **Lesotho.** ** **9N5YDY** the **UNICEF Amateur Radio Club** has only limited operating permission. ** QSLs for **TI9W** and crew should go to **TI2KD.** ** **Frank VK0DA** is now QRT from Heard Island. Cards to **VK9NS.** ** **5A0A** still finding it hard to get QSOs . It appears his paper-work is identical to that of **G3JKI/5A** which is acceptable to the DXCC desk at Newington. ** **South African Antarctic** stations now use the prefix **ZS7.** ** **His Majesty King Hussein JY1** is expected to visit VK again later this year. ** **3A7A** will be used to celebrate the **National Day of Childhood** on March 29. A special QSL card has been struck for the occasion. ** **Jim VK9NS** and **Bob W5KNE** hoped to be operational from VK9Y last month. Jim also hoped to be active from VK9X.

THANKS

Sincere thanks to the Editors of weekly, bi-weekly and monthly publications such as: *ARRL Newsletter; BARG; CQ-QSO; The DX Family Foundation Newsletter; Inside DX; KH6BZF Reports; Long Island DX Bulletin; NIAR News Letter; Papakura Radio Club Bulletin; QRZ DX; RSGB DX News; QRZ DX, RSGB DX News* and *The W6GO/K6HHD QSL Manager List.*

Magazines including *Break In; cqDX; DX Post; JA CQ; JARL News; KARL News; Meteorological News; QST; Police Life; RadCom; Veron; Weather News* and *Worldradio,* to mention but a few.

Individual contributors this month include VKs 1SK, 2PS, 3YL; K1BV, ON7WW and staff of the Lillydale Municipal Library.

Sincere thanks to one and all and good DXing.

LATE NEWS — PETER I ISLAND FACTUAL

Amateurs world-wide has a present with the actuation of Peter I Island by Norwegians, LA1EE and LA2GV, who put it on the DXCC Countries List as from January 24.

The two operated without fear or favour, at times with the cacophony of people tuning on their operating frequency to high-power operators calling outside their band allocation and abusing others for using the frequency they were not supposed to be operating on. It is quite a long period since I have heard such a spread of stations calling from all continents at the one time and unfortunately operating procedures have deteriorated to unnecessary profanities and remarks, against all regulations and principles of the privileges we are given.

To the stations that missed out I commiserate, but many VKs did make it without too much hassle, including myself, with a very "croaky" voice, on the third or fourth try. To those who worked them a number of times to "make sure" on one band, I will leave the readers to think what my remarks could be.

Congratulations to the operators, the captain and crew of the vessel that landed the group and stood-by off shore whilst the action too place in such an inhospitable and lonely part of the world.

SOME RARER DX WORKED ON THE EAST COAST

14 MHz

3Y2EE, 3U2EE*, 3Y2GV, 3Y2GV*, 4S7NS, 4S7WP*, 4X6RA, 7S3FRO, 8R1RPN, FK25DK, HK5BEG*, IS0ATP,

KC4AAC, KC6HA, T32AF, T77F*, UO5OEK*, V85SB (YL-Sophia), VK0DA (HI), and ZL6OR.

21 MHz
3Y2EE, 3Y2GV*, DL6WT*, EA4BWN*, F2NB*, HA5OG*, HB9BQB*, IK2FMI*, OE5CA*, and YU7BZD*.

28 MHz
JAs from most call areas.

** denoted CW, others SSB.*

—73, Ken VK3AH
ar

SAINT HELENA

The much sought after DXCC country of small Saint Helena Island is 122 square-kilometres in area, has a population just in excess of 5000 and is located 1850 kilometres from the west coast of Africa.

The island was discovered on May 21, 1502, the Feast Day of St Helena (mother of the Roman Emperor, Constantine), by Joao da Nova Castella, a Portuguese navigator. The island was known to other seafarers of the era, particularly the captain and crew of a Dutch East India vessel, the *Witte Leeuw* who lay at anchor in St Helena's James Bay, when she was ambushed by Portuguese vessels in 1613. According to reports of the time, the vessel was blown to pieces.

The *Witte Leeuw* was returning from the Far East and, according to her manifest apparently carried by a sister vessel, was carrying a full cargo of spices, 1311 diamonds and other valuables such as jewels and Chinese porcelain. This was not too much of a challenge for Robert Stenuit, a man renowned for his study of researching wrecks and an experienced diver. Armed with ample research that gave him the history of the vessel and backed by a crew of experts just over a quarter of a century ago, he decided to seek the remains of the *Witte Leeuw* and the treasures she contained.

Robert, and later his crew, dived in James Bay, eventually finding and verifying the wreck. They found an abundance of porcelain, jade and other valuables scattered for several metres around the wreckage, but no diamonds. Upon further research and assistance, they realised the truth in the statement "blown to pieces." The diamonds had been scattered and covered by the sands of time — an impossible task to find the majority, sheer luck to find one! (Incidentally, the majority of the recovered pottery now graces Amsterdam's Rijksmuseum and has proved valuable in establishing the authenticity of antiques fired before and after that era.) It is thought that most of the salvaged collection came from Chingtechen, where a century later a travelling Jesuit priest reported that 18 000 potter families kept 3000 kilns burning.

The English East India Company claimed ownership of St Helena in 1659, after a brief Dutch occupation. In 1673, the Company again confirmed their ownership and it was estimated that half the population were imported slaves. It was not until 1836 that the slaves were freed.

It is not generally known that, due to the remoteness, Saint Helena was the ideal location to place exiled Emperor Napoleon Bonaparte, in 1815. The English took control of the island until his death in 1821 and it was handed back to the East India Company until 1834, when the English again took possession.

The island was reasonably prosperous until the opening of the Suez Canal in 1869, which dramatically changed the trend of shipping routes.

During WWII, this tiny island, even though it could not support an airfield, was of significant importance to the allies.

In 1960, it was decided to place a telecommunication centre on Ascension Island which provided employment for some of the island's inhabitants.

In 1966, royal instructions, through and Order in Council, gave St Helena a considerable measure of self-rule, becoming effective on New Year's Day, 1967.

The island is of volcanic origin, though any activity is now extinct. An annual rainfall of 750 millimetre in the centre of the island, tailoring down to a mere 200 millimetres on the coast, falls on the undulating area of cliffs varying in an average height from 135 to 600 metres. The highest points are Mount Actaeon and Diana Peak, which are approximately 820 metres above sea level.

The Climate is temperate because of the Atlantic Ocean's trade winds and varies in temperatures of 21 to 29 degrees Celsius in summer to between 18 and 24 degrees Celsius around the coastal region. Higher areas of the island are approximately five degrees lower in all seasons.

The middle of the island is suitable for agriculture and forestry and support a native bush gorse (spiny evergreen shrub), cabbage palms, eucalypti of various species, willows, poplars, maize, potatoes and green vegetables. Rabbits, mice and an abundance of rats inhabit the island which has only one native bird, the wirebird, which can be likened to a small plover. Introduced species, plentiful though not abundant, include ground doves, ring-necked pheasants, partridges and Java sparrows. There are no fresh-water fish, but strangely, of the 65 varieties of salt-water species caught, 17 are peculiar to the island.

As less than one third of the mineral-free island is suitable for cultivation, the economy is strained and relies on the sale of carvings, fancy woodwork, and furniture made from timber grown in accessible areas and a fishing industry of mainly tuna, caught by trawlers out of the only port, Jamestown, which can accommodate vessels of any size.

In excess of two-thirds of the island's budget is subsidised by the United Kingdom, the balance being made up by the sale of lace, threadwork, beautiful stamps for which the island is renowned, frozen processed fish, woodwork and furniture.

The population consists of European (mainly British), intermingled with those of Asian and African descent, all speaking English, the only recognised language. The area, including the Dependencies of Ascension and Tristan de Cunha, are now administered by a governor who is also the President of the Legislative Council, constituted by 12 elected members.

The area is catered for by a small hospital which supports a small medical and dental staff. Schooling is free, yet compulsory for children aged between five and 15. The Judiciary consists of a Chief Justice, Magistrate and elected Justices of the Peace.

So, to those who are dedicated to going on DXpeditions, go to St Helena Island, the island that's only bay probably holds a fortune, and combine a little diving with the radio! One diamond could finance a DXer's trip, including free QSL cards, for a lifetime. Any takers?

DISTRESS CALLS

Many amateurs, during the course of their pursuits for DX, unfortunately encounter distress and "Mayday" calls. It is every amateur's duty to cease normal traffic and assist, to the best of their ability. Also, it is an offence to interfere with emergency communications or to communicate them to a third party for gain or reward!

The National Maritime Safety Division of the Commonwealth Department of Transport is responsible for coastal and seafaring vessels within Australian waters, and they will return your telephone call or you may call direct and reverse the charges in the case of an emergency.

For Australian mainland catastrophes the nearest police station or police communications headquarters in each State will be able to assist.

The following is to be used as a guide and is part of Section 3.1 of the National Search and Rescue Manual, which is presently being extensively revised. However, the following information should be used in the interim.

If possible it is advantageous if both sides of the radio contact can be tape recorded for checking by the authorities and also for one's own reference.

APPENDIX 3.1
DISTRESS CALL INTERROGATION FORM
For use by operators of the Inshore Boating (IBRS) and Amateur and Citizens Band (CBRS) radio communication services

PART 1: Essential Information

Note: If any answer indicates that a genuine distress situation exists, immediately carry out standard procedures, then continue interrogation.

WHERE
1. Where is distress position? Latitude, Longitude/ Bearing and Distance from geographical feature or place.
2. What part of Australia is it near?

WHAT
1. What is the nature of the distress?
2. What help is required?
3. What is the weather situation at the distress?

WHO
1. How many people are in Distress?
2. Who are they? Hikers/Motorists/Boats/Aircraft.
3. Any identification? Names. Registration numbers/Call signs.
4. Description of distress vehicle.

WHITHER
1. What are distressed persons' intention?
2. Are they remaining at scene of distress?
3. If not, where are they going?

WHEN
1. When was call first heard/last heard?

PERSONAL IDENTIFICATION AND COMMUNICATION DETAILS
1. Name of Receiving Operator.
2. Address.
3. Telephone Number.
4. Do you think call is genuine? WHY?
5. Is any station still in contact? YES/NO
6. If YES how may they be contacted?
7. Is the message being recorded on tape? YES/NO

PART 2: DESIRABLE INFORMATION

MARINE INCIDENT

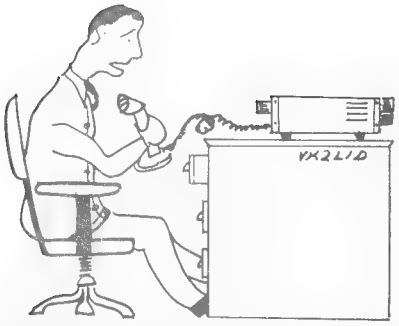
Description of Vessel
What type of vessel is it? Fishing vessel/Motor boat/Yacht
What is its name?
How many masts?
Length; Registration Marks; Fuel Type; Hull (colour); Sail Number; Radio Call Sign; Sails (colour); Deck (colour); Superstructure (colour); Type of Engine fitted; Hull (material); Range or Endurance.

Safety and Emergency Equipment
Anchor YES/NO
Lifebuoys YES/NO
Flares YES/NO (type and number)
EPIRB YES/NO
Dinghy YES/NO
Food (amount) pounds/kg
Life raft YES/NO
Water (amount) gallons/litres
Life Jackets YES/NO
Radio Type Frequencies

Voyage Details
Departed Date/Time Destination
ETA Contacts Address
Phone No
Owner/Agent
Next of Kin

Special Medical Assistance
If a medical problem exists:
(a) Is the person conscious? YES/NO
(b) Can the person walk? YES/NO
(c) If medication is delivered, will the problem be solved? YES/NO
(d) What medication is required?
(e) Is a doctor/nurse required? YES/NO
(f) Is there an area suitable for helicopter landing?
(g) Could the person be winched into a helicopter?
(h) Are seas considered calm enough for seaplane landing?

The Call
What time was call first heard/last heard? ---/---
What was signal strength/readability? ---/---
What was accurate text of call?
How often was it heard?
Did your station acknowledge the call? YES/NO
Did any other station acknowledge? YES/NO
Identity:
Were acknowledgments heard by distress station? YES/NO



"THAT M/M STATION . . . I'M SORRY, OM, I WASN'T PAYING ATTENTION — WHERE DID YOU SAY YOU WERE SINKING?!"

Was two-way communication achieved? YES/NO

Was the person Calm/Agitated/Coherent/Incoherent?

Was the accent Australian/Other (identify)

Was any background noise heard (Engine noise, talk, party voices, etc)?

Were the answers given to your questions sensible or reasonable?

What do you think was not sensible or reasonable?

Do you think the call may be a hoax? YES/NO WHY?

If location of distress not clearly given

Did skip conditions exist? YES/NO

If YES, from what distant areas were calls of similar signal strength being received?

The Receiver

Type of set (Manufacturer and Model)

If frequency is unknown, what channel was call received on?

How many channels on your set?

My advice is, if you cannot actually assist and the stations have good propagation, monitoring the frequency taking notes. If relays are required briefly advise the station in control, or taking the information, of your call sign and indicate that you have adequate copy and are backing up.

IARU 50 MHz BEACONS

Freq MHz	Call Sign	Location	Country	Mode	Ant	ERPW	Notes
50.003	PY1RO	Rio de Janeiro	Brazil	A1			
50.005	H44HIR	Honiara	Solomon Islands				QRT?
50.005	PY1AA		Brazil	CW			
50 005	ZS2SIX	Cape Province	South Africa	CW	T'stile	10	
50.006	GB3RMK	Inverness	United Kingdom	F1A	DP (N/S)	30	
50.007	TF3T		Iceland				QRT?
50.010	JA2IGY	Mie	Japan	A1A		10	
50.010	ZS1STB	Still Bay	South Africa	F1	2 el DL (N)	50	
50.010	ZS6STB	Vereening	South Africa				
50.013	P29BPL		Papua New Guinea	A1A		30	
50.015	SZ2DH	Athens	Greece				QRV after 1300
50.020	GB3SIX	Anglesey, Wales	United Kingdom /I073TJ	F1A	3 el Y (W)	100	
50.025	ZS6SIX	Kempton Park	South Africa				QRT?
50.025	5Z4YV		Kenya				QRT?
50.025	6Y5RC		Jamaica	F1	3 el Y (NW)	40	QRT
50.030	ZE3VV	Yucatan	Mexico /EL50EX	A1	GP	5	
50.030	ZS6PW	Pretoria	South Africa	A1A	(N/NWW)		QRV 1000-2000 UTC
50.033	LU8YYO		Argentina				
50.035	EL2CA	Monrovia	Liberia				QRT?
50.035	HC1JX	Quito	Ecuador				QRT?
50.035	ZB2VHF		Gibraltar /IM76HE	A1	5 el Y (WNW)	100	
50.038	FY7THF		Fr Guiana	F1	Vert	100	
50.041	WA8KGG	Ohio	USA				
50.045	OX3VHF	Julianehaab	Greenland /GP60QQ	A1A	GP	20	QRT
50.045	DL3ZM /YV5	Caracas	Venezuela				
50.048	VE6ARC	Alberta	Canada	A1	GP	50	
50.048	WA6IJZ	California	USA	A1	Vert	10	
50.050	GB3NHQ	London	United Kingdom /I091VQ	F1A	T'Stile	15	
50 050	LU2DH		Argentina				QRT?
50.050	ZS6LN	Petersburg	South Africa				QRT?
50.055		Oslo	Norway				Proposed
50.055	WA9FEF	Chicago, IL	USA	A1			
50.060	GB3RMK	Rosemarkie, Scot	United Kingdom /I077UD	F1A	DP (N/S)	20	
50.060	PY2AA	Sao Paulo	Brazil		GP	25	
50.060	WA8DNQ	Cincinatti, OH	USA	A1	Hor Omni	2	
50.060	ZS6DN	Pretoria	South Africa		4 el Y (N)	100	QRT?
50.062	W3VD	Laurel, MD	USA /FM19	A1	Halo	10	
50 064	N4PZ	Sarasota, FL	USA	A1	Vert	0.5	
50.064	WA5UUD	New Orleans, LA	USA				
50.064	N7DB	Boring/ OR	USA /CN85			30	
50.065	W5VAS	Metairie, LA	USA	A1	Halo	1	
50.065	WB5ZRL	New Orleans, LA	USA	A1	Halo	2	
50.065	W0IJR	Denver, CO	USA /DM79	A1	Halo	20	
50.066	KA0CDN /W0IJR	Denver, CO	USA	A1			
50.067	WA6IJZ	Oxnard, CA	USA /DM04		Vert	770	
50.069	W0BJ	North Platte, NE	USA	A1	T'stile	6	
50.070	VP9WB		Bermuda				QRT?
50.070	K1NFE	Burlington, CT	USA /FN31		GP	25	
50.070	W2CAP/1	Cape Code, MA	USA /FN41	A1	Vert DP	10	
50.070	KS2T	Toms River, NJ	USA /FM29VX	A1	Halo	10	
50.070	WA2YTM	Rochester, NY	USA				
50.070	KA4VEY	Harvest, AL	USA		Vert	10	
50.070	WB0CGH/5	Lewisville, TX	USA /EM13	A1	Halo	1 5	
50.070	WA7ECY	Troutdale, OH	USA		Vert	10	
50.070	K0HTF	Des Moines, IA	USA /EN31DX	A1	Omni	2	
50.070	ZS3E		South West Africa				QRT?
50.070	4U1ITU	Geneva	Switzerland				Proposed
50.071	WA2YTM	Victor, NY	USA /FN12	A1	Hor Omni	15	
50.072	W9KFO	Eaton, IN	USA				
50.073	W7KMA	AZ	USA				
50.075	VS6SIX		Hong Kong	A1A	GP	10	
50.075	N5JM	New Orleans, LA	USA /EL49	A1	Vert	3	
50.075	ZS3E		South West Africa				QRT?
50.077	N0LL	Smith Centre, KS	USA	A1	Halo	30	
50.077	VE3DRL	Toronto, ON	Canada				
50.080	TI2NA	San Jose	Costa Rica	A1			
50.080	W1AW	Newington, CT	USA /FN31	A1/F	Beam west	50	
50.080	ZS5TR	Durban	South Africa				QRT?
50.080	ZS5VHF		South Africa	A1	Halo	10	
50.086	VE2STL	Val Belair, PQ	Canada		DP	3	
50.088	VE1SIX	NB	Canada				
50.096	HD1QRC	Quito	Ecuador				QRT?
50.099	KH6EQI	Pearl Harbour	Hawaii				QRT?
50.100	HC2FG	Guayaquil	Ecuador	A1			
50.100	PY5YD		Brazil				
50.109	JD1YAA		Minami Tori-shima				

1987 PERTH INTERNATIONAL ELECTRONICS SHOW

Last years show was hailed by both the industry and the media as the most successful electronics show ever staged in this country. The 1987 show plans to build on this goodwill, and no effort will be spared to make this, the ninth show, even more successful and a most worthwhile event for its exhibitors.

The Electronics Show will again be held at the Claremont Showgrounds from July 29 to August 2, 1987. However, July 29 has been set aside for an exclusive trade and media only preview.

The floor layout has been given an exciting "new look" hope to enhance exhibitor exposure at the show.

Further information may be obtained from Chris Gulland, Manager of the Perth Electronics Show, PO Box 745, West Perth, WA. 6005. Telephone (09) 382 3122.

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1-16	½''	3''	16	5.50	21	$2 12
2-08	⅝''	3''	8	2.70	19	$2.50
2-16	⅝''	3''	16	8 00	21	$2.50
3-08	¾''	3''	8	2.90	19	$3.05
3-16	¾''	3''	16	10.90	21	$3.05
4-08	1''	3''	8	4.80	19	$3.38
4-16	1''	3''	16	19.90	21	$3.38
5-08	1¼''	4''	8	9 40	18	$3.74
5-16	1¼''	4''	16	37.50	21	$3.74
8-04/4	2''	4''	8	—	18	$5.45
8-10/4	2''	4''	10	32.25	18	$5.45
8-12/4	2''	4''	12	—	19	$5.95
8-16/4	2''	4''	16	83 50	19	$5 95
8-08/7	2''	7''	8	—	18	$9.45
8-10/7	2''	7''	10	60.80	18	$9.45
8-12/7	2''	7''	12	—	19	$9 95
8-16/7	2''	7''	16	157.75	19	$9.95

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The inductance values shown are approximate allowing for any variations in wire gauge and other small manufacturing variables.

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ar86

50.110	KG6DX		Guam				QRT?
50.110	ZS6LN		South Africa	CW	7 el Y	100	Intermittent
50.120	ZS3E		South West Africa				QRT?
50.125	ZS3AK		South West Africa				QRT?
50.246	LU8MBL		Argentina				QRT?
50.440	K1NFE	Hartford, CT	USA				
50.500	KH6EQI	Pearl Harbour	Hawaii /BL01XH	A1	3 el Y	80	
50.500	5B4CY		Cyprus /KM64PR	F1A	GP	15	
50.945	ZS1SIX	Cape Province	South Africa	FSK/FM	Omni	8	
51.020	ZL1UHF	Nihotupu	New Zealand	F1AAN		25	
51.030	ZL2MHB	Fernhill	New Zealand	F2AAN		10	
51.225	ZL2VHT	Inglewood	New Zealand	F1AAN		15	
52.033	P29BPL		Papua New Guinea				
52.100	ZK2SIX		Niue Island				
52.150	VK0CK	Macquarie Island	Antarctica				
52.200	VK8VF	Darwin, NT	Australia		GP	15	
52.250	ZL2VHM	Pahiatua Track	New Zealand	F1AAN		8	
52.300	VK6RPH	Perth, WA	Australia				
52.300	VK6RTV	Perth, WA	Australia				
52.310	ZL3MHF	Christchurch	New Zealand	F2AAN		20	
52.320	VK6RTT	Carnarvon, WA	Australia				
52.325	VK2RHV	Newcastle, NSW	Australia				
52.330	VK3RGG	Geelong, Vic	Australia	F1	XDP	4	On trial
52.350	VK6RTU	Kalgoorlie, WA	Australia				
52.370	VK7RST	Hobart, Tas	Australia				
52.420	VK2RSY	Sydney, NSW	Australia				
52.425	VK2RGB	Gunnedah, NSW	Australia				
52.435	VK3RMV	Hamilton, Vic	Australia				On trial
52.440	VK4RTL	Townsville, Qld	Australia				
52.450	VK5VF	Mt Lofty, SA	Australia				
52.460	VK6RPH	Perth, WA	Australia				QRT?
52.465	VK6RTW	Albany, WA	Australia				
52.470	VK7RNT	Launceston, Tas	Australia				
52.490	ZL2SIX	Blenheim	New Zealand	F2AAN		10	
52.500	JA2IGY		Japan				
52.500	ZL2VHM	Palmerston North	New Zealand				
52.510	ZL2MHF	Mt Climie	New Zealand	F1AAN		2	

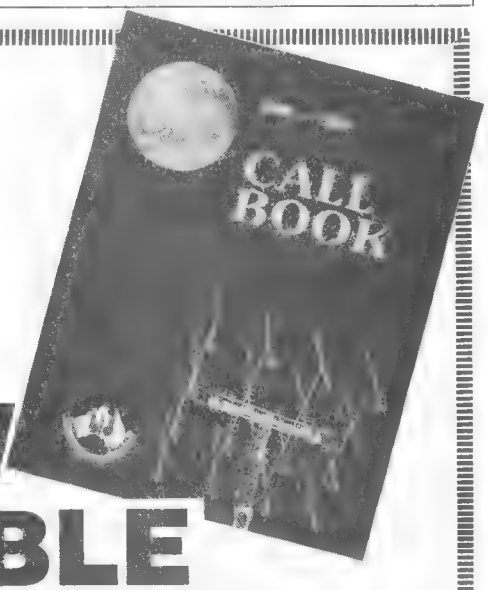
Compiled by IARU, October 16, 1986

DOC STATISTICAL SUMMARY

This summary outlines details of stations currently licensed as at September 1986.

AMATEUR

Station/Service	ACT	NSW	VIC	QLD	SA	NT	WA	TAS	TOTAL
— Beacon	—	18	20	30	4	2	21	2	97
— Limited	54	873	1033	375	275	26	221	103	2960
— Limited/Novice	16	335	295	242	125	20	94	42	1169
— Novice	53	888	759	616	332	48	214	97	3007
— Unrestricted	184	2793	2443	1452	1042	71	908	348	9241
Subtotal	307	4907	4550	2715	1778	167	1458	590	16474
									REPEATERS
— Amateur	—	43	52	33	14	2	15	13	172



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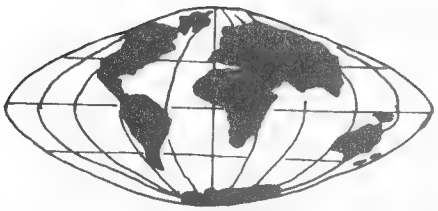


VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Minami Tori-shima*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.150	VK0DS	*Macquarie Island*[1]
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.345	VK4A3P	*Rockhampton*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*[2]
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*[3]
432.450	VK3RAI	*MacLeod, Melbourne*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

1 As Sojo VK0SJ, was to leave Macquarie Island in February 1987, and his place taken by VK0DS, whom I understand will also be operating on VHF, I have changed the call sign of the VK0 beacon to VK0DS, pending any advice to the contrary.

2 My note book tells me someone from VK4 said the two metre beacon was now signing VK4RTT instead of VK4RBB. The list is amended accordingly. However, I am not aware if VK4RBB on 432.440 has also changed. Would someone please advise me of the status and call signs of the various beacons in VK4, particularly around the Brisbane area. I have corrected the location of VK4ABP, which for some reason last month I listed as being in Rockhampton instead of Longreach. Sorry!

3 A new North Queensland beacon in Cairns, has appeared on 432.445 MHz, signing VK4RIK. This is direct from Ian VK4AFC, in Cairns. Ian also told me that permission has been granted for the Cairns people to establish beacons on 52.445, 144.445 and 1296.445 MHz, as well as the 432.445 beacon already listed. The others will appear as they are assembled.

THE BEACONS

The beacons throughout Australia have certainly played their part during the Es openings this summer. I found myself checking them more than ever before and in most cases they have been reliable pointers to band openings, at least giving some warning even if there is no one listening at the other end to reply to your call! There is no doubt I worked ZK2RD because I had been monitoring the ZK2SIX beacon for some time and alternately calling near the beacon, also on 52.050 MHz. VK5ZWP, kindly informed me where I could find Robert and promptly worked him. I was not so successful with VK0SJ, as I heard the beacon on three occasions but still missed Sojo. *Them's the breaks! ! !*

SIX METRES

From the viewpoint taken in VK5, the Es summer period, which has now quietened down to some extent, was certainly another very healthy season, even if somewhat different from last year. I felt the band started opening earlier in 1985 with the results there was a slackening off for a couple of days on 28/12 and 29/12. Sure, there were contacts to be made but not with the ferocity one expects around that time — not here anyway. I was portable at Meningie and on the band all day, and every day for a week, so I did not miss too much, but I still did not work as many stations as I had expected.

I felt there was a greater awareness of the possibility of two metre contacts by many more operators this year, hence they were off six metres for longer periods. Their vigilance paid off because it was another incredible year on two metres, but you will have to turn to the Two Metres Section to read the details.

As I said last month, there would be some important events leading up to Christmas which I would have missed and that turned out to be so! But by being on the bands more I was able to fill in a few of the missing spots. I was surprised to learn of all the JA stations which had been worked around the end of October, particularly 26/10 which appeared to be the best day into North Queensland and as far south as Sydney. JA4MBM had a ball by working VK1, 2, 4 and 6. The next day, JAs worked Alice Springs; on 1/11 VK2XJ worked a string of JAs in their 1, 2, 4, 5 and 7 districts.

It appears the eastern States may have been having better Es conditions than VK5 for the first half of November. ZLs were certainly being worked on a daily basis, FK8EM was there in the mornings, also FK1TK. Someone said they were hearing a beacon signing FK8KAB around 50.050 MHz and the VK0SJ beacon was being heard frequently leading up to several VK3s, including VK3AZY working VK0SJ on 20/11 around 0900. On 23/11 it was a good day for Niue Island with the ZK2SIX beacon alerting VK2 and VK4 the path was open. Nev ZK2AZ/VK4ZNC, then worked stations in Brisbane, Sydney and ZL. The next day the great conditions continued when VK0SJ worked VK2, 3, 5 and ZL. ZLs are still coming in every day mixing it with the VK2s and VK4s.

Short skip opening from VK5 to VK3 around 0400. The FKs had been heard most days, but not strongly, but on 2/12 FK worked into VK6 as I reported last month, plus VK6YU working a FK25. Heaps of ZLs and P29 worked from VK5. Later in the day, P29 to VK3 and VK4. Last month I reported 5/12 as being a good day, but I missed that VK0SJ had been very active, even Jim VK3AZY, worked him three times that day! 5W1GA worked VK2 and VK3 and later VK2BA worked VK0SJ. Hard to believe he could be on so much and VK5LP didn't work him! Interesting to hear that Nev 5W1GA worked FK25TK on 0020. No reason why he shouldn't of course, as it is around 1250 km which would be okay for Es.

That fills up some of the gaps but I know there are a lot more. Anyway, now on to 22/12. The band was open well before 0000 UTC and plenty of ZLs. Then VK2 and VK4 filled the band and many were worked, rarely anyone under S9. VK1VP worked at 0119 while VK2 and VK4 continued to predominate. At 0449, VK5LP worked FK8EB 5x6, but later he was much stronger. At 0512, I was pleased to work Robert ZL2RD at 5x7. Niue Island was a new country for me. Earlier, VK2YDC had been heard working P29BH at 0036, but not audible here. Also learned that, on 21/12, VK1VP had worked ZK2RD and P29ZES worked to Rockhampton, whilst for good measure, Lyn VK4ALM worked VK0SJ. ZLs were working to Alice Springs. Had contact with VK5NC at Mount Gambier who said he had worked VK0SJ on 24/11 (late news obviously).

23/12: VK5LP starting to get ready for portable expedition to Meningie, 100 km south-east of Adelaide taking 52, 144 and 432 MHz. Still keeping an ear on six though. Noted VK4ALM saying he was hearing FK8, but darned if he could work him. ZK2RD worked VK3AMK and about 20 others from 0530. ZLs everywhere! Heard FK8EM. Also noted plenty of two metre activity but this is reported elsewhere. Travelled to Meningie on 24/12.

PORTABLE FROM MENINGIE

26/12: No opportunity to get on before this date due to Christmas commitments. First contact was Les VK3ZBJ 5x9 on 144 so that looked promising. Six metres was a bit quiet so used the other two bands until ZLs poured in around 0600. Worked ZL3 and 4, then the ZLs became more interested in working VK6 from 0700 onwards! At 0745, heard VK0SJ at S2, but missed him. 0350 VK8GF worked FK8EB 5x9 also P29BH, VK2 and VK4 to VK8. VK4FNQ and others in Cairns also worked VK0SJ. VK4JH at Townsville heard FK8. VK4FXX reported band open all day to VK8. Excellent tropo conditions on other two bands.

27/12: Band open from about 2200, VK2 and VK4. At 0002 (UTC day 27/12) there was Dave VK6AOM, Carl VK6XW and Bob VK6BE all 5x9 to 0100. VK8s decided to stay in for most of the day, both from Alice Springs (VK8s ZLX, ZMA, GF, etc) and Tennant Creek, VK8ZCU. VK2 and VK4 much of the time, VK4ALM at 0049, VK4ABP (Longreach) 5x9 at 0225, then over to Joe VK4JH at Townsville for quite a long chat (no one else seemed to want him), VK8ZLX worked VK2BY at Broken Hill. Still plenty of two metre activity.

28/12: Open before 0000 to VK2 and VK4. Said "Good Morning" to Lyn VK4ALM again today. Then worked some VK4s on two metres (details elsewhere), VK4ALM in and out for most of the day. At 0717, worked Colin VK4ACG on Thursday Island 5x5. Colin said there would be another six metre operator on the island before long. Band went quiet.

29/12: A day spent in the doldrums. No six metres. Just as well some contacts could be had on 144 and 432. Six metres opened at 0800 to VK8ZLX 5x9, but he did not want to speak to me. However, VK4FXX did, even though I receiver 5x1. From 0830, the band came good with VK2 and VK4s. Worked Bob VK2ASZ, at 0838, who said he and two other VK2s and several VK4s had worked 3D2ER at 0800. Had spoken to Nev VK4ZNC earlier and been advised Nev had left some gear and a beam for six metres on 3D2 and 3D2RM would be using it. Another station, 3D2DW could only operate on Saturdays but would be on. Bob had also been hearing the ZK2 beacon which had become very reliable. VK2s still going strong at 0930 UTC.

30/12: Next morning a further "Good Morning" to Lyn VK4ALM, then at 2310 it was VK4ZJB, 2311 VK4FXX and 2352 VK8ZLX. VK4s until around 0300. Heard VK6AOM. At 0330 heard VK2ZHE working FK8EB, VK5NY and VK5LP heard him but could not get through the VK2 QRM. VK6AOM at 0520, VK6BE at 0549. 0721 VK2BQY, then up to VK4FNQ at Cairns, ending at 0813 with VK8KTC, at Tennant Creek. During the contact with Steve VK2BQY, he told me that on 13/12, VK0SJ had worked VK4ABP, VK4FNQ and VK4FXX, so Sojo was certainly getting plenty of widespread contacts.

31/12: Lyndsay did not appear this morning but Peter VK8ZLX said "Good-day" at 0000, then there was plenty of VK4s and VK2s, who stayed around for several hours. John VK4FNQ was there around 0315, then 0328 VK8ZCU and VK8KTC, from 0405 it was back to VK4FXX and VK4ZWB at 0559, 0631 to VK8ZLX — the band certainly chops around. At 0818, worked FK1TK, then VK2ZGB.

1/1/87: Six metres a bit slow starting, but had a ball on 144 and 432. From 0104 it was VK4PU, 0114 VK2EXB, 0120 VK4ZNC, 0145 VK7JG, VK7ZOO and VK7LZ. At 0221, VK7ZIF was heard mobile. At 0328, VK6AOM, 0350 VK4ALM (good afternoon), 0414 Bill VK4ZWH, 0443 VK2BBR. At 0641, the ZLs pounded in and worked ZL1, 2, 3 and 4. By the way. Paul VK2EXB, told me there are eight six metre stations in P29, including P29ZEF, BH, PL, ZFS and, I think, PR (he faded out as he told me). Lyn VK4ALM, has also upgraded to solid state six metre equipment. At 0731, worked Jim VK3AZY/3 at his portable site at Metung and he gave me, first-hand, some details of the VK0SJ two metre contacts into VK3. Also worked VK3AUU at 0756 and VK3ZAT at 0801, then over to VK8ZLX at 0812 with his usual 5x9 signals. And that was the end of the Meningie expedition for this summer.

Since then, on 3/1 VK4FXX worked P29ZEF. On 4/1 at 0134 VK4FXX, VK2s, then 0514 VK4ZET/4 and that was the last Ross Hull Contest number exchange I had. With the close of the contest there seemed less activity on the band but it may have been conditions. On 5/1, some VK2s and VK4s, same on 6/1 but with VK8s. On 8/1, it was VK6BE at 0920, VK8ZLX at 0925 and 1010 VK5AIM! During the contact with Bob VK6BE, he remarked that the six metre band had been open in Albany daily for five weeks. While talking to Peter VK8ZLX, he told me he was about to start testing on 1296 MHz, so he is certainly going all-out to cover the various bands. On 9/1, starting before 0000 it was the turn of the ZLs again. At 0020, ZL4TBN 5x9, 0033 ZL2CD 5x9, 0046 ZL4KB/2 5x6, 0103 ZL1TZA 5x6, 0121 ZL3THM 5x9 and there were others. Bill ZL2CD, who works only six metres, said he was pleased with this year, his best contacts being to 3D2, FK1, VK0, P29, VK6, 5W1, JA and ZK2. He said there seemed to be a lot of VK6s, up to 12 at a time. The day was rounded off with VK4ALM at 0916. On 11/1, VK2, VK4, VK1, VK6 and ZL1. On this day, VK5LP kept the usual sched with Mark VK0AQ at Mawson, who advised he was keeping the VK0MA beacon on the air as much as possible in keeping with the problems they have down there of the AC power dropping out, which necessitates a trip to the beacon shack (about 600 metres away through the snow) to get it going again! Frequency is 52.408 and is running about 70 watts output. So far Mark had heard no six metre signals this summer. 13/1: VK2 and VK4 and ZL1. 14/1: VK4 plus ZL1. The band is quietening down!

TWO METRES

As expected, two metres has once again provided an incredible number of contacts all over Australia and New Zealand. Anyone who has the equipment and has not had a share of the Es contacts available has either been unfortunate or inattentive. VK5LP did not work as many stations as last year, but that was my fault, they were there to be worked! Not only have there been so many outstanding Es contacts Australia wide, but there have been some really excellent tropo contacts as well.

The Es coverage is shown fairly dramatically on the accompanying map which this year has been given some more detail as the map caused quite a lot of interest overseas last year, and the extra details and State boundaries will more clearly define the areas covered. No tropo contacts are shown on that map, although many such contacts were into the areas on the map. The tropo contacts are mentioned throughout the text as we go through it, there seems little point in splitting the two in the narrative. To allow readers to compare this year with last year, I have also reproduced last year's map. It becomes immediately apparent that much more territory has been covered this year!

The increased interest shown by the Alice Springs operators in upgrading their equipment and their antenna systems paid off handsomely with increased contacts, and their awareness that they live in a rather unique area and will be in demand keeps others looking for them with the result that if the band does open to VK8, you can almost be assured there will be someone on the band to work, and that is a comforting thought for those still requiring a VK8 on two metres to complete working all States.

The band really got underway quite early. Considerable continuing activity using aircraft enhancement for signals between VK3, VK1 and VK2 are now the order of the day. Those involved include:

VK3UM, VK3AUG, VK3AUU, VK3AZY, VK3KEG, VK3ZAT, VK3NM, VK1VP, VK1BG, VK1RK, VK2ZAB, VK2ZRE.

These operate using the flight paths of aircraft between Melbourne and Sydney. Also, VK5NY, VK3AIH and VK3LK also do the same thing using aircraft on the Adelaide to Melbourne path.

One of the first good tropo openings occurred on 4/11 between VK3AUU and VK3AMZ to VK2DVZ and VK2ZAB, from 1000 to 1100 UTC. As the high pressure system moved out into the Tasman, excellent conditions prevailed from Sydney to New Zealand with VK2ZAB at least being worked on 70 cm to ZL2.

Probably the most exciting news for the month was the first ever contact between a VK0 station and Australia. This occurred on 24/11 at 0854 when VK0SJ worked VK3AMZ on 144.150, followed by VK3AZY at 0856. Jim said signals were S1 at his QTH. Further contacts were established at 0951 up to S7 with QSB and Sojo worked VK3DUT, VK3AWY, VK3XQ, VK3AQR, VK3ZZX and VK3BRZ. VK7JG heard VK0SJ during this time but did not work him. Sojo said there had been a magnetic disturbance and some auroral activity. Six metres had been S9+ for several hours leading up to these contacts. Congratulations. Thanks to Jim VK3AZY, for this late information, also for what may have been the first VK3 to VK6 Es opening when VK6AOM worked 12 VK3s between 0920 and 1005. I hope there is no confusion between these contacts and those I reported last month for 28/11 when VK6AOM worked 10 VK3s and five VK5s on tropo!

TWO METRES AND ABOVE FROM MENINGIE

26/12: Station set-up and tested okay by 0230. At 0233, worked Les VK3ZBJ, on 144.100 at 5x9. 0425 VK3ATN 5x4 on 70 cm and 5x7 on 144.100. 0436 VK5NY both bands; 0518 VK3BDL 5x5, 0527 VK3AIH 5x5. Then tried 70 cm with VK3AIH and signals were 5x8. 0806 VK5NC 5x9 both bands, 1038 VK3BRZ/3 on Blue Mountain 5x7, VK3AUU 5x8 on two and 5x3 on 70 cm, 1055 VK3UG 5x6, VK3CM 5x3, VK3DKJ 5x3, VK3AXH 5x7 all on two, 1105 VK3BRZ/3 5x5 on 70 cm. VK3AOS 5x4 on 70 and 5x6 on two, 1203 VK3UM 5x5 on two, 1220 VK3ZBJ both bands about 5x5, 1242 VK3HV 5x3 on two and VK5ZDR 5x7 on 70 cm with beam on Melbourne.

27/12: The next morning, the tropo conditions were still very good, although Roger VK5NY, was having considerably more success than I was. However, at 2345 I worked VK1RK 5x2 and could hear VK2ZAB to S4 with QSB, but unable to work him. VK5NY worked VK2ZAB 5x2 at 2317, also VK1RK, 1VP and 1BUC. Roger had been alerted by strong signals from various repeaters and noted VK1RCC the beacon was S2 at 2003. He used the Wagga repeater to alert the VK2s and worked VK2SW, VK2KAW and VK2ZMP; and VK2DPG and 2BY in Broken Hill. Later at 0406 VK5NY worked VK8ZLX on two metres 5x9, heard VK8GF but no contact.

VK5NY said VK1RK had been audible for more than two hours during the morning of 26/12 (UTC). At 2300 VK1RK, 2339 VK1BUC, 2348 VK1VP. Most contacts were on 144.200 MHz. Those involved in all this activity included VK5NY, ZDR, RO, ZPS and LP. At 0420 VK8ZCU heard VK5NC on 144.100 for a few seconds.

Roger VK5NY, reported very strong signals to Les VK3ZBJ, on 144 and 432, so naturally the 1296 gear was fired-up. He worked VK3ZBJ 5x9, VK3DQD 5x2/3 at 1255 and VK3NM same strength at 1350. VK3ZL, at Ballarat, was heard but not worked. With all these happenings it is small wonder Roger broke open a bottle of his favourite tawny port and celebrated!

28/12: Reasonably strong signals from VK2 and VK4 on six metres before 0000 UTC. At 0110, Jim VK5ZMJ, at Port Pirie, and other VK5s, worked Brian VK2CMC on two metres. At 0120, Roger VK5NY worked Brian with signals varying from S3 to S9+20. At 0151, VK5NY worked VK4ZET and VK4GP and I was getting further down in the dumps! Then suddenly at 0158, there was Jim VK4AJO at 5x9 and during the next half hour I worked VK4ZWB, VK4ATP, VK4KLJ (Lorraine — for her first VK5 on two metres!), VK4AGQ, then VK4ZWB again as he kept calling CQ with no response.

Sporadic E on 70 cm?

While all this was going on, Roger VK5NY at 0218 was transmitting a signal on 432.100 to Steve VK4ZSH, and whilst no two-way contact eventuated, it seems certain Steve was copying Roger's CW ident/call sign. Had a contact resulted it would certainly have been the first from VK5 to VK4 on 70 cm, but there are other ramifications. Some authorities over the years have expressed doubts as to whether Es ever gets as high as 70 cm, but in this case, as Roger says, had it been via tropo there surely would have been other closer stations following the path to Brisbane which is the normal tropo pattern. On the other hand, 0218 is not a time when many 70 cm stations would be in the normal course of events. If any other stations between VK5NY and VK4ZSH did hear Roger's signals I am sure he would like to know so the propagation type can be better established. For the moment it seems likely to have almost been a Es contact. Perhaps next year more of us should try on 70 cm when there are good two metre openings. Australia is well suited geographically for these experiments to be conducted and centres of VHF/UHF population are well spaced to allow Es to eventually happen if it is going to! A good effort Roger and Steve — another tawny port please.

TWO METRES AGAIN

Still on 28/12, VK5NC, VK5ATD, VK5MC and VK3LK/5 (all in the south-east) worked VK4LE after confirming the band could be open by watching the FM channels. No other VK4s on. While talking about using FM band (commercial) for VHF pointers, Peter VK8ZLX said on 27/12 that he worked VK5NC after noting that Channel 3 television was snow free in Alice Springs. At the same time, VK5NC was heard in Tennant Creek.

When I was talking to Colin VK4ACG on six metres, he informed me that two metres had been open to the Cairns repeater during the morning.

The next morning at 2331, VK5NY worked VK7DC 5x2. At 2340, VK7ZOO was weak on 144.100 MHz, but VK3AIH was 5x9 at 2313 on two and 5x4 on 70 cm when VK5LP worked him. VK5NC worked VK7DC on 70 cm. The good tropo opening was drawing to a close but there were still some good signals around although many from Melbourne were not strong.

29/12: Mostly VK5 144 and 432 contacts during which Roger VK5NY advised he had again worked all States on two metres. That is rather good when one thinks it took some of us around 30 years to do due to the absence mainly of VK8 stations.

31/12: Mick VK5ZDR, worked a VK4 for a brief flitting contact. Conditions were good to Mount Gambier with 5x9 signals on both 144 and 70 cm to VK5NC, VK5AXV from Meningie around 0200. Worked VK3ZBJ at 0728 on 144 and then on 432

both signals being 5x9. Then went on to work VK3AUU 5x6, VK3ZAT 5x5, VK3AMZ 5x4, VK5DK and VK5NC (Mount Gambier) 5x9 both bands. A check later in the evening indicated the cool change was causing signals to fall off. However, next morning at 2352, Jim VK5ZMJ, was 5x9 on 144 and 5x7 on 432 so conditions were better to the north-west for me.

1/1/87: Very pleased to work Neil VK5ZEE, at Woomera, at 0003 on 432 at 5x9 and on 144 also to S9. The distance is around 750 km and is rather a poor path from my home QTH. Caught up with Jim VK5ZMJ, again at 0010 and had nearly an hour with him cross-band 144-432, discussing pleasantries. Jim mentioned he had worked Doug VK3UM on both bands. At 0117, VK5NC worked VK4ZAZ, and another eight VK4s on two metres, also VK3UM, VK3AUU, VK3BEH, etc. Roy VK3AXV, at South End (south-east) worked eight VK4s in 11 minutes. Bill VK4ZWH, at Bundaberg, reported working VK1, 2, 3 and 5 on two metres during the morning. A report came in that VK8LM, in Darwin, had worked a VK2. I checked this with Peter VK8ZLX, who telephoned Darwin and was advised no such contact had been made! So you see your scribe does check up on things every now and again particularly if they do not quite fit into the pattern of propagation. VK4ZWH said the two metre band had been open to ZL for more than two hours on 22/12 with ZL1BHX S9 for four and a half hours! On 26/12, he had worked VK8ZCU and VK8KTC, in Tennant Creek, at S9+ and was able to have a good contact using only one watt. Bill said he had worked more than 300 VK3s on two metres over the past three years — not a bad effort and illustrates what a good path exists to Bundaberg and with an alert operator at that end.

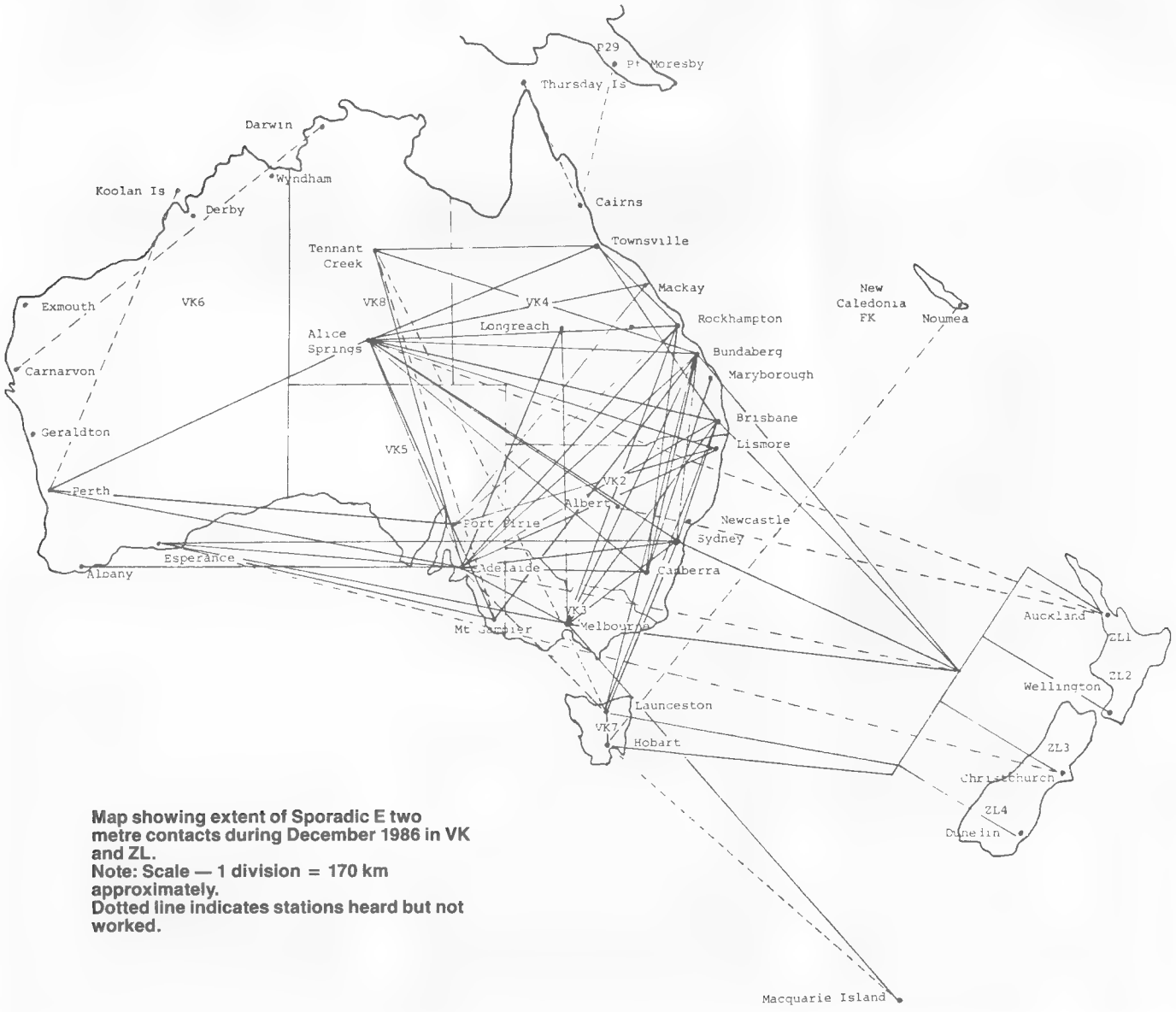
Talking with Joe VK7JG, on six metres, he told me that the had heard VK0SJ on two metres. At that time Sojo ws working the VK3s and that VK7KJ had heard an FK8 on two metres and VK3VD, had worked ZL3PN during that opening. VK3UM and VK3AUU worked VK2KAW at Wagga and Gordon VK2ZAB, in Sydney.

From here on, the activity dropped off with the end of the holiday period and with a reduction in the Es propagation. But on 7/1, VK5NY and others were having plenty of contacts into VK3 on 144 and 432. On 8/1, ZL4TBN was 5x9 into VK2. Peter VK8ZLX worked VK2DDC and VK2EMA at 0343 and 0346 and heard a weak VK3. Peter said the FM band was full of signals at the time and Channel 4 television was snow-free.

Summarising: We all thought December 1985 was a tremendous two metre period but I am sure most would agree December 1986 was even better if this was possible! The coverage this time was Australia-wide; last year VK6 missed out but this time with the contacts into Perth and Esperance from VK5 and VK8 in particular all have shared. The ZLs have been particularly active and kept the boys in the eastern States, in particular, on their toes both on 144 and 432. The upgrading of stations and the keenness of the VK8 boys has also been instrumental in keeping vigilance on two metres at a very high level.

Four years ago, I started hammering away in these columns that some very good two metre periods would be coming our way in the low part of the cycle and this, together with much better antenna systems as the result of activities through OSCAR and other satellites has ensured a lot of people on the air prepared to watch two metres and they have certainly been rewarded. Continuing typical comments noted on six metres were: "Six is pretty good, can we try two metres" or "Do you have two metres — take a listen on 144.100 as I have a signal there now" etc.

Of particular note has been the change of apparent circumstances leading up to two metre contacts. Previously, most authorities said it was necessary for very strong short skip contacts to be available on six metres before it was worth trying two metres. Last year, I noted that when Col VK5RO, and I worked VK8GF on 16/12/85 to give us Worked All States on two metres that six



Map showing extent of Sporadic E two metre contacts during December 1986 in VK and ZL.
Note: Scale — 1 division = 170 km approximately.
Dotted line indicates stations heard but not worked.

metres, whilst good, was not excessively good. Later, contacts to VK2 and VK4 confirmed such situations did exist. The same was found this year. I recall working a string of VK4s in the Dalby region when the band was virtually clear of VK4 six metre signals, even Channel 0 was absent! There were no short skip VK3 40 over S9 signals to say try two metres. I could hear VK5NY working the VK4s some time before I could, but by monitoring two metres they eventually came to my area showing the areas covered can be quite selective. It was an uncanny experience to hear Roger giving the VK4s 5x9 reports one after the other and I could not hear one!

What I am saying, I suppose, is that under suitable conditions, two metres is open more often than we previously thought, and that, whilst short skip still indicates a high or rising MUF, it is not the only required circumstance, but an additional one. One other good indicator is the commercial FM band, particularly in areas away from capital cities which fills with signals from all over the country as the MUF rises. Finally, of course, the Australia-wide beacons also help to warn operators of possible openings; the existing television channels to 5A also serve as indicators.

Next December? I see no reason why we should not have further good two metre and possibly 70 cm Es openings, particularly if we are still not too far out of the low part between cycles. Time will tell, of course, but if each year we still continue to have good two metres in parallel with six metres, then all I can say is that, for too long we have been missing out on good openings because, in the main, we have been looking for short skip and with insufficient operators on the band with the required dedication to make it work.

ROSS HULL CONTEST

There were certainly a lot of stations around giving out numbers and some really good scores as well. Les VK3ZBJ, must have got close to 1000 (perhaps he went over) and that is good scoring from three bands. There were many stations also saying they were not in the Ross Hull Contest but were prepared to give numbers to those wanting them. My own log book shows I worked a total of 93 different stations with whom I exchanged numbers.

As the continuation of the contest looks like being a Federal Convention matter this year, we need to ensure that the contest is continued and that would be helped if there was a good log return to the Federal Contest Manager. I believe VK7 will look after the Contest next year.

I am presently researching the Ross Hull Contest and propose writing it up as a separate article for *Amateur Radio*. I would appreciate any constructive comments from the fraternity. I would like to have them on my desk by April 10, please. Matters I would like to discuss concern the length of time of the contest, the dates, bands to be used and the scoring table. If you have any input on these matters, please write to me in a constructive way. I have letters already from Peter VK3YRP and Graham VK1BGG (ex-VK8GB), now in Canberra. I stress again, please write to me because if I can have my article finished by April, it cannot get into AR before June at the earliest and that is six months after the start of the last contest; so time is precious.

THE TWO METRE MAP

This shows the extent of two metre contacts throughout Australia and New Zealand for the 1986 Summer Es period, no tropo contacts have been included, if there were, there would be even more lines on the map! The map is drawn to scale so those not conversant with the distances in Australia can at least work out the path distances of contacts. Unfortunately, some promised logs have not arrived here by my deadline for copy so the information shown relates purely to what I have observed or heard on the air and been involved in during my own contacts. My relatively large notebook contains 19 pages of information gleaned from listening around the bands since the beginning of November 1986! Whilst all you other people do not have to bother with notes if you don't want to, if I am to feed you information later, then my pencil does overtime all the time I am on the bands. Jim VK3AZY, would know what I mean — I expect he does plenty of writing too.

The map comes to you E & OE (errors and omissions excepted — or should it be accepted?). I believe it is substantially correct and it has been vetted by Trevor VK5NC, who paid me a state visit recently before publication.

To save too many lines going across the Tasman to New Zealand I have again drawn a parallel line system for that country and the point of intersection from other areas does not indicate a specific call area, but just that ZL was involved. Since all four main ZL areas were heavily involved this year, there is no point in dividing them up.

We "down under" have had two exceptional two metre Es years. Last year the Northern Hemisphere did not react in the same way apparently, and did not follow the VK/ZL pattern. It will be very interesting to see if they follow it in June 1987.

THE ENDING

In fairness to the Editor, I think I should start closing off now. I am holding over a couple of letters which will still be relevant next month and extracts from various magazines as well. It is important the results of the summer Es period are written up for posterity soon after it all happens, otherwise it loses its relevance very quickly.

If you want some depressing reading, I suggest you read the article by Leo McNamara and Roger Harrison, in January 1987 AR, entitled *Predicting the size of the next maximum of the solar cycle*. I know Peter VK8ZLX will be really depressed!

Did Darwin miss out on the Es this year or was it that there are no operators. I might have missed them on six metres and nothing heard down this way on two metres. Don VK6HK, told me that VK6UF, on Koolan Island, accessed the Perth repeater VK6RAT, on Es but no contacts. VK6GU, worked Japan from Wyndham on two metres, but has now shifted to Derby. With the change of angle it will be interesting to see if Japan is workable!

On 5.7 GHz, Don VK6HK, has equipment with an output of 1 mW and this signal is detectable at two kilometres using an inside dipole. More testing is going on!

Finally, I did not sum up the Es period on six metres. Suffice to say it has been a great year in most places (there have been a few quite spots), and all VK States and ZL districts have been worked by most operators. So you have had VK1, 2, 3, 4, 5, 6, 7, 8, ZL1, 2, 3, 4, P29, YJ8, 5W1, 3D2, ZK2, FK and, of course, VK0. I have never heard any H44 or VK9 activity.

Our thanks must go to Neville VK4ZNC, for mounting the DXpedition to the various areas of the Pacific (ZK2, 5W1 and 3D2) which have given a number of operators their first chance to work some rare countries on six metres. I would also like to commend Nev's skill as an operator, he certainly is able to extract the most from the band and give the maximum of contacts possible in a given time. Well done, Nev.

CLOSURE

Closing with two thoughts for the month: *One who never asks knows either everything or nothing* and *Some people make you feel at home. Others make you wish you were.*

—73 *The Voice in the Hills*

This map indicates the spread of two metre contacts during late-December 1985, between Australia, New Zealand and New Caledonia. To stop crossing lines into New Zealand all contacts have been indicated to a central point, which could mean any one of the four ZL call areas. The dots around the Australian coast-line, starting from North Queensland and going clockwise are for Cairns, Townsville, Rockhampton, Mackay, Brisbane, Byron Bay (blank), just inland is Narrabri, Taree, Sydney, Canberra, Melbourne, Mount Gambier, Adelaide, Port Pirie, Esperance and Albany (blank), Perth, Carnarvon and Darwin at the top. In the centre is Alice Springs and above that Tennant Creek. Longreach is in Central Queensland and Springsure/ Emarald is further east towards Rockhampton. The dotted lines indicate signals heard but not worked. Tasmania shows Burnie in the north, Launceston and Hobart towards the bottom. Noumea (New Caledonia) is the island in the Pacific with lines drawn to it.

What the Government gives you,
the Government can take away,
and once it starts taking away,
it can take more than it gave!

Attributed to Samuel Gosper, US Labour Leader, 1850-1924, and published in *QRM*, November 1986

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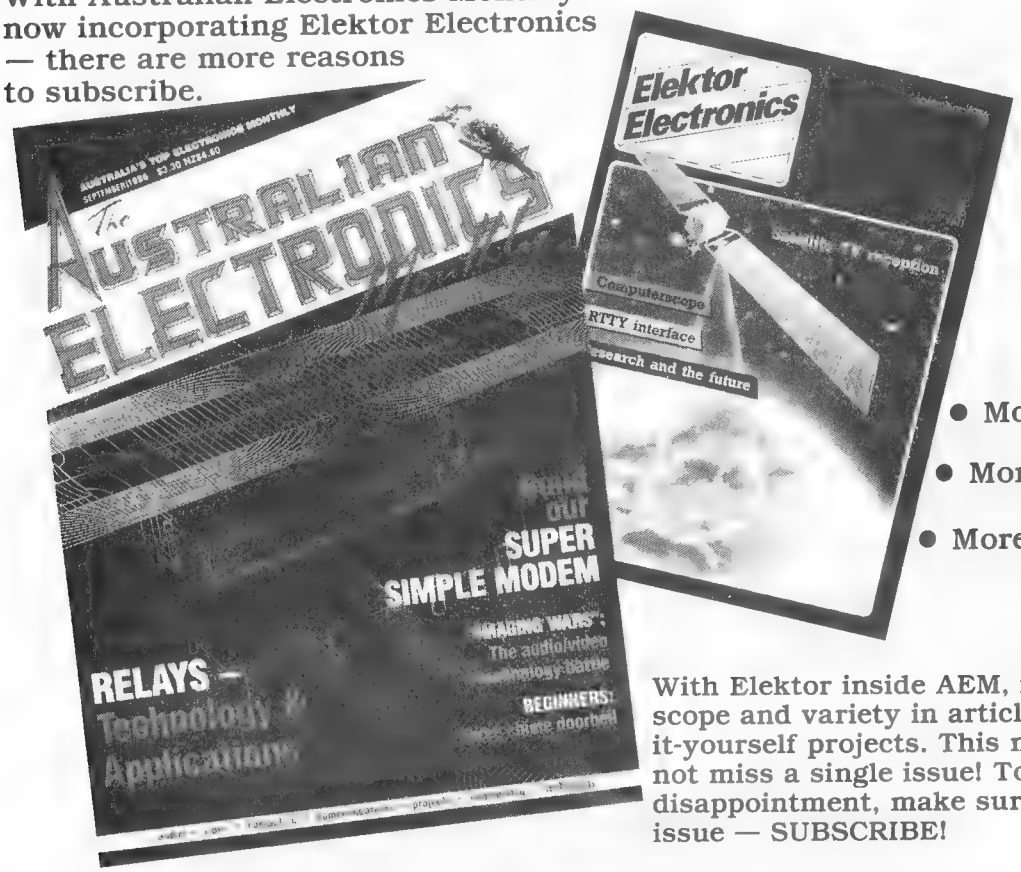

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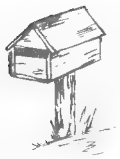


TECHNICAL MAILBOX

COAXIAL CABLE

VK3 . . . Mitcham, Victoria
(What about some input other than VK3! ! !)

"I have heard that coaxial cable commonly used as antennae feedline has a useful life span of six years. Is this true? How can I check if my existing feedline or secondhand coax is okay?"

Well John, your questions brought back memories of one of my past encounters with secondhand coaxial cable, once purchased from a now defunct secondhand outlet. Beautiful half inch RG-8, it appeared in genuine 1948 mint-condition! I lost no time in installing the connectors, ran it up the tower and attached it to the 50 MHz beam. Fired up the rig — beauty . . . 1:1.05 SWR!

It soon became abundantly clear that signals from across town were some 40 dB lower than normal. Conversely, my signal was similarly attenuated.

Attenuation or lossy coaxial cable! ! ! Wish I had kept the cable for I would love to donate it to a certain local who has just moved in on my patch.

Back to John's questions — firstly, with respect to the useful life of coaxial cable. The six years you mention John, does not appear to have much substance and may have been promoted by those retailing such products? It is more to do with just how well it has been installed and maintained. Cockatoos can play a significant role if you have them in your area.

It is probably best to differentiate between modern coaxial lines to those produced prior to 1975. It is true that in earlier types the material used for the insulator and outer protection cover degraded with age. The inner, as many will recall, will be found to have changed colour from milky or translucent to that of a distinct yellow. These visible changes signal that the loss of the cable may well have increased above that when originally manufactured. The outer covering may also become brittle to the point of cracking and generally is the result of the sun's ultra-violet radiation.

The modern versions have improved dielectric properties; eg foam, lower loss and outer protection less susceptible to ultra-violet radiation.

Firstly, I believe that if the price exceeds that equivalent to "falling off the back of a truck" figures. . .don't buy! Good coaxial cable should be the next priority after your rig or even taken to the extent of purchasing a less expensive rig and spending more on your feedline. In other words, secondhand coaxial cable is a risk and especially if you wish to use it for VHF/UHF. . .don't. Secondhand Heliax® is somewhat different. In this case the product is of a modern generation where the cost is significantly dearer and, as such, a "punt" is worthwhile.

Now for some visual tips to guide you. Naturally, ascertain that the length is suitable and you will not have to use joiners. Next, have a look at both ends by stripping back about 30 cm to expose the shield. Is the shield bright and shiny without any sign of corrosion? Is the centre insulator translucent and not showing signs of yellowing? Strip back a small piece of the insulator. The centre conductor should also be bright and shiny. The point here is to be sure that water has not found its way into either end of the cable.

If both ends appear sound, the next step is to carefully inspect the entire length for cuts, nicks or abrasions that may have allowed moisture to enter. Reject if the outer cover has been damaged.

In the case of foam Heliax, repeat the above and additionally inspect the outer for possible crimping. Reject! In this case, it is difficult to be sure that moisture has not entered the ends of the Heliax, however if there is slight discolouring this is a fair sign of trouble. It is wise, before installing connectors on such cable, to assume moisture ingress and to cut 30 cm from each end. Whilst mentioning connectors for Heliax, remember that these are most expensive if you should have to purchase them new.

Finally, when inspecting your prospective buy, make sure of the cable impedance. Trying to match a 50 ohm load via 75 ohm coaxial cable can cause considerable consternation.

As can be seen, moisture is a major problem. Should it penetrate the ends, can they be cut back sufficiently to overcome the problem (and still leave enough for your run!). If it has penetrated mid-length it would be scrap value only. It amazing just how far moisture can travel down coax, having entered solely via a poor connecto

It can be seen that installing coaxial cable is j not as straight forward as you may wish. Con nectors taking the weight of the feedline, coaxial cable rubbing on towers or sheds, sharp bends o in line connectors should be avoided.

Now regarding the method of measuring yc feedline loss. It is worthwhile to remember that even if water has entered the cable and losses are present, it is likely you will be unable to pick from measured SWR, which may improve.

Assuming you have both ends of the cable available in the shack, connect the far end to matched dummy load and the near end via a power meter to your transceiver. If you do not have these items, try and borrow them from a friend. Forget the "old wives tale" of using incandescent light bulbs. Switch to CW and adjust your output power to the highest possible without overtaxing the final. Without changing your transmitter settings, move the power meter to the dummy load end of the line and repeat. Note the power at thi point. Calculate the line loss in dB. (You work out how — a refresher course!). Relate this figure i dB to the length of your coaxial cable with that o the manufacturer's published loss in dB/100 fee or dB/30 metres. If a noticeable discrepancy apparent then check your connectors again and, if okay, (I do not subscribe to cheap "mud" ver sions), it is time to make a decision. . .Thi attenuation will add to your receiver noise factc and on VHF/UHF it is paramount to keep such losses as small as possible.

The bottom line is — do not skimp on your feed. It is money well spent, should last for years if installed correctly, and may well be cheaper than a linear amplifier which will only improve your transmission.

In most instances, a good feedline will improve your station's overall performance *more* than adding a linear.

A top feedline, plus a linear. . .well that is different story!

It is pointless having a "big mouth and wax in your ears"! ! !

® Registered trade mark of Andrew Antennas

Try This!

COMMUNICATIONS/MUSIC SPEAKER SYSTEM

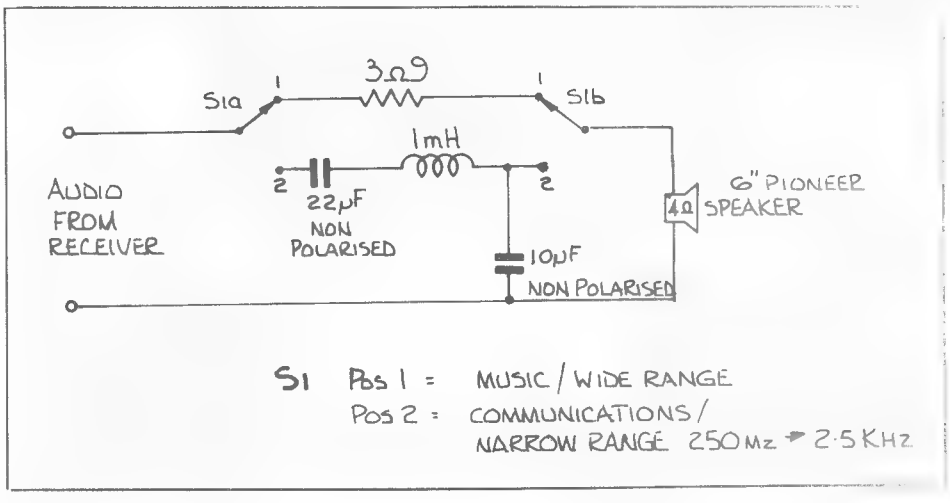
Rodney Champness VK3UG
31 Helmes Court, Benalla, Vic. 3671

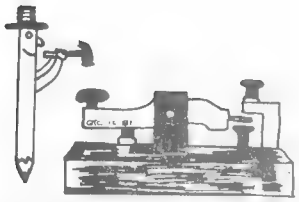
In the January issue of *Electronics Today International*, there was a project on a communications speaker. This, to me, was quite interesting but it had one drawback in that, if you wish to listen to music it was necessary to disconnect it and replace it with another speaker or endure poor reproduction of the music.

I decided there was an easy way out of the problem, build the system with a switch that bypassed all the frequency shaping components. This was done and, to equalise the audio output, a resistor was wired in series with the speaker.

The speaker system now performed both operations well. The switch was mounted in a convenient position on the front panel of the speaker box and was suitably labelled.

The only extra components used are a DPDT toggle switch and a half- watt 3.9 ohm resistor.





Pounding Brass

Gilbert Griffith VK3CGG
7 Church Street, Bright, Vic. 3741.

I love seeing photographs of other amateur shacks. I am as ready as the next person to purloin an idea. So, whenever I am visiting or looking at shacks, I always take note of any layouts that look particularly good.

Many amateurs can get along quite well on the dining-room table, if allowed. But I prefer to be as efficient as possible, especially as I am a little pushed for space, in a 2m x 2m x 1.2 metres wide old storeroom/cupboard over the stairs. Therefore, I have about one square-metre of floor space and the same in desk space. I made the desk-top about 1.2 metres deep so that I can put a rig on it and still have room for pads, logs, keyers, coffee, etc.

If you have more than one rig, a shelf or two can be built over the desk to hold as many pieces of equipment as you like. Try starting your lowest shelf at about 300 mm above the desk-top so that you can rest your elbow on the desk whilst tuning — the readouts then come to about eye-level. The rest of the layout is up to yourself — it may be quite different if you are a "south- paw", or if you prefer phone to CW!

Try to make your shack comfortable. I fell it should be as comfortable as your bed as many of us seem to spend as much time in the shack as in bed!

There is nothing quite so frustrating as having to curtail a QSO or a good rag-chew because the other person is freezing to the key or can't hear because of the rain on the roof. A good supply of insulation or cane-ite lining does wonders and only take you a day or so to install. (It will also give you a great surface for pinning up QSL cards, too!). I have cut numerous holes in my cane-ite lining to install a tuner, power-board, etc, and all it took was a ruler an a sharp knife.

If you need to add height to your chair, use castors — they are easy to weld on and may save you from a sore back.

If you are starting afresh, ensure you install a good earth. Heavy braided cable can be run from terminals (as many as you can) to a few long stakes in the ground outside the shack. Consider a quiet extractor fan as, with all the insulation, you will find that even on a cool night your gear will warm the shack considerably and opening the window will only invite the mosquitoes. (Have you ever tried to work with headphones on and with a "mozzie" buzzing around you?).

THE SHACK

I have mounted a 200 mm piece of 50 mm plastic pipe through the wall to exit my antenna wires — it is easy to thread a wire complete with a coaxial plug through, even with seven or eight wires already installed. If it is permissible in your locality, install a large circuit breaker in the 240 volt feed to the shack, if you feed the clock/s from the lighting circuit you can then pull the big switch to turn everything off.

As for antennas, I think I will leave that up to you — or you can make suggestions to me! What do you use? I have a five-way coaxial switch with five tuned antennas for three different bands. This is fed to one input of the transmatch/power/SWR meter so that, no matter which of the antennas is 'on' I can press one button and I'm on the 20 metre beam, or press another and get the antenna matched to another band, via the tuner. It takes me no more than five seconds on four watts to fine-tune a mis-matched antenna or a long wire, and I refuse to talk to anyone who takes more than 10 seconds to tune-up, especially when it is on top of someone else. I cannot understand why an operator wishing to break-in cannot QSY 2 kHz down to tune-up and then come back on frequency to call! Any comments?

Do I give you the impression that I am an efficiency expert? I hope not. It is just that, if you don't do your best, you will never be a good operator. Whether you work DX or contests, you will have to be good if you want the best, or most contacts. Being an award holder or a contest winner should not take brains or a lot of money, it needs dedication and effort. Who was it who said; "you get out of something, that which you are prepared to put in"? For instance, what happens at your place in an emergency? Have you a spare antenna rolled up somewhere? What about batteries? These days we can expect to be called on to do our share in an emergency, and it is good PR if you are prepared. (Even better if you tell people about it).

A couple of ex-Telecom batteries, or even slightly worn car batteries will keep you on air, even at reduced power. All you need is something to keep them charged, anything from a solar-panel (they are getting cheaper), to a mains charger or an old car alternator and mower engine. You might even get involved in the John Moyle Memorial Field Day, the once-a-year-contest that everyone participates in.

Well, there's a few ideas for those days and nights when the QRN is just too much. How about sending me a photograph of your pride and joy — the shack — for this column?

I received a letter recently from Merv VK3ADX, who has built nine paddles. Merv was referring to my Gilcher article in January AR, and asked "What is the definition of a good paddle? Is it individual choice or are there definite parameters to be met?"

I have a couple of my own ideas which I incorporated into the Gilcher paddle, but maybe you can help. Can one learn to drive any paddle well? Do we go for price, looks, function or what? I have heard some terrific CW sent on a hacksaw blade used as a keyer, conversely, I have heard some real trash from a Bencher paddle!

A few months ago, I built a paddle with no moving parts at all, just two touch plates, thinking it would be the "ultimate." It now belongs to Phil VK3CDU, who calls it the *Beast*. I thought the idea was new, but since then I have seen a circuit for the same sort of paddle in a very old magazine. The old circuit even had a sensitivity control and a power supply, so it's another case of 'it's already been done.'

However, it was fun building it and crazy learning to send on it, as you had to take the finger right off the contact and only lightly touch it to generate CW. Have a try yourself and see if it suits you — cost is about 50 cents, or less!

73 es cul, Gil VK3CGG.

WICEN News

Ken Ayres VK4KD
STATE WICEN CO-ORDINATOR
WIA Queensland Division

WICEN IN A NUTSHELL

HOW OFTEN HAVE YOU HEARD AMATEUR RADIO IS ONLY A HOBBY

Agreed, we all enjoy the chit-chats with our amateur radio friends, get a thrill out of working the elusive country or experimenting with RTTY, ATV, Packet Radio, Satellite, etc — that is the "Hobby" we all enjoy.

WICEN is *NOT* a hobby, it is a *SERVICE* provided by the Amateur Radio Service for the Statutory Authorities and in participating we are putting something *BACK* into the hobby, instead of *TAKING* all the advantages that the hobby offers.

As a Back-up Communication Service for Australia, we are dealing with the authorities, whether it be the State Emergency Service, the Police, the Army or the Navy.

Therefore we have to have the following:

1 A Chain Of Command
2 Discipline
3 Training

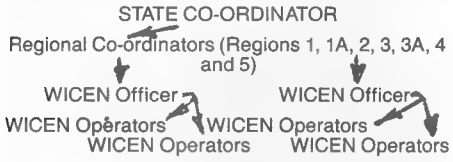
1 A CHAIN OF COMMAND

Any organisation, if efficient, has to have a policy. In the case of WICEN this is set by the Federal Executive of the Wireless Institute of Australia through and on the recommendations made by the Federal WICEN Co- ordinator in Canberra, ACT.

This policy is given to the State Co-ordinators, who are responsible for organising the State accordingly.

Whilst WICEN, in the individual States, is an autonomous organisation, it is subject to any by-laws laid down by the State WIA Divisional Councils within the overall policy. Each State Co-ordinator works closely with the State Council and important issues, such as financing or major changes on the state organisation, are mutually agreed upon.

In Queensland the chain of command for WICEN is as shown.



A Regional Co-ordinator is responsible for a number of *WICEN OFFICERS.*

A WICEN Officer is responsible for a group of *WICEN OPERATORS.*

Each group has its own Net Control Operators, Signal Clerks and Deputies.

2 DISCIPLINE

We are not a Para-Military Organisation as has been sometimes said.

We each have to carry out the responsibilities as instructed by the person delegated to issue such responsibilities.

Such persons are elected or nominated by popular choice in a democratic manner. If any of us acted contrary to such instructions, chaos would soon result.

Bear in mind that we could be involved with a life and death situation and any foul-up or delay could result in a tragic result, either to persons or property.

The regulations clearly state that to handle Emergency Traffic for the Statutory Authorities this can only be done by a recognised Emergency Organisation, ie WICEN.

It is not mandatory to be a member of the Wireless Institute of Australia to be a member of WICEN.

In Queensland, we have recently issued a policy in conjunction with the authorities, which requires that members of WICEN groups providing communications for the authorities *to formally join the State Emergency Service.*

This provides insurance protection from claims arising for personal injury during an emergency or disaster. Under certain circumstances vehicle and/or equipment damage may be covered.

It also gives members of such groups the privilege of being issued with a SES Identity Card so that, if necessary, one can enter an area in the course of duty which may be prohibited to the general public.

On formally joining the SES one does so as a WICEN Communicator and would not be expected to carry out rescue work as the normal SES Personnel are so trained to do.

A local group of trained WICEN/SES members can be approved and recognised by the SES as a Special Resources Group.

At all times, WICEN personnel are expected to carry out the duties as detailed by the WICEN officer only.

The SES gives the WICEN officer the communication tasks required.

3 TRAINING

WICEN Operators should be completely familiar with:

a Types of messages and how to speak
b Phonetic alphabet and pronunciations
c Precedence and priority of messages
d How to offer and receive messages
e Use of pro-words
f Map reading

This training, and more, is laid down in the *Queensland WICEN Manual of Operating Procedures and Information.*

One duty of the local WICEN officer is to ensure that the members of his group are *trained* in these procedures, either by regular lectures, on-air training nets and/or practical exercises.

WICEN NEEDS YOU! ! !

The more communications during an emergency or disaster, the more lives can be saved or property salvaged.

The larger the area covered and the greater participation of trained radio amateurs, the better the service we, as stations in the Amateur Radio Service, can provide for the authorities.

Individual radio amateurs can, alternatively, be of service to the community by participating in *Welfare Traffic* for the public provided by the *Australian Traffic Network (ATN).*

For further information on this network, please write to Sam Voron VK2BVS, 2 Griffith Avenue, East Roseville, NSW. 2069 or John Aarsse VK4QA, PO Box 211, Nambour, Qld. 4560 (SASE please), or see page 176 of the *1985/1986 Australian Radio Amateur Call Book,* remembering that operational procedures may be slightly different to those of WICEN, but still require a similar discipline, training and chain of command to be of value to the community.

Inquire at your local club about WICEN or read page 166, of the *1985/1986 Australian Radio Amateur Call Book,* or write to your State WICEN Co-ordinator.

WICEN — BE IN IT!

ar

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

As I write this column in January 1987, with the thermometer sitting on 30 degrees Celsius, I am reminded of the world-wide fraternity of amateur radio, as I recall receiving Season's Greetings from intruder watchers in Japan, the United States, Holland, New Zealand, all States of Australia and from many other amateurs scattered in various parts of the world. Surely no hobby is as far-reaching as ours! Intruder-wise, the scene has been fairly static (no pun intended) but we continue to receive support from interested amateurs and SWLs.

Those who contributed for November 1986 were:

VK1GD, VK2s CNS, DVW, G H A Bradford, VK3s AMD, DKE, XB, VK4s AFA, AKX, BG, BHJ, BTW, DA, KHQ, KHZ, VK5s GZ, TL, VK6s JQ, RO, XV, VK7RH and VK8JF.

The breakdown of reports is as follows:

308 broadcast intruders (A3E), 190 CW intruders (A1A), 95 RTTY intruders (F1B), other modes 192, and 59 intruders sent their call sign.

One interesting report is that Colin VK4AKX, is hearing the USSR Naval Intruder *UMS* on VLF, 16.5 kHz! This intruder is really getting around.

The *Voice of America* was reported by several on 14.070 MHz, and we hope this is only a temporary transgression.

Jammers were prolific on 15 metres, and were all presumably USSR-based, according to their call signs.

The Woodpecker was reported on 7, 14 and 21 MHz.

As reported in an earlier column, the statistics for the whole of 1986 will probably be available for the April issue of AR.

VK3XB is suffering a lot from cordless telephone interference on 3.511 and 7.022 MHz.

Bumped into Roy VK6XV, quite by accident on 20 metres recently, who was operating the special event station, VK6CUP. Roy was promptly joined by Roy VK6BO, and Bruce VK6XZ, the IW Co-ordinator for VK6. It is always nice to meet people by chance on air.

In six years, I have worked *one* South African station, 'way back in 1984, and his card arrived via the bureau a couple of days ago. Almost restored my faith in human nature. (ZS's are very rare in this shack!). Wish I could get one from VU.

So, here we are, well into another year, and we hope that the year in retrospect will see more good things to report on intruder activity, and less gloomy news. See you next month, and take care.

ar

WIA VIDEO TAPE PROGRAM TITLE LISTING

SEE NOTE	TITLE (in chronological order within each subject grouping)	LECTURER	PROD	APPROX TIME in MINS	COL/ B&W	YEAR MADE/ 19..	DESCRIPTION & OTHER INFORMATION
GENERAL PROMOTIONAL FILMS							
—	The Ham's Wide World		ARRL	30	Colour	69	*Superseded by "The World of Amateur Radio"*
—	This is Amateur Radio		ARRL	15	Colour	70	*Pitched at Teenagers*
—	Moving up to Amateur Radio		ARRL	15	Colour	75	*Pitched at CBers*
©	7J1RL DX- pedition		JARL	60	Colour	76	*General Amateur Radio Interest: LOAN ONLY*
—	This Week Has Seven Days looks into Amateur Radio		HSV7	25	Colour	78	*Pitched at Teenagers: includes some ARRL footage*
—	Amateur Radio — The National Resource of Every Nation		VK5KG	6	Colour	79	*Encapsulates AR: good for public exhibition*
—	The World of Amateur Radio		ARRL	30	Colour	82	*Pitched at Adult Level*
HISTORIC INTEREST							
©	Wireless Telegraphy — circa 1910		?	10	B&W	10	*Archive Material courtesy David Wardlaw VK3ADW*
‡©	Amateur Radio (TV Pilot Program		WIA NSW	30	B&W	58	*Archive Material courtesy TEN Channel 10*
—	Opening of Burley Griffen Building — SA HQ		VK5KG	50	Colour	77	*Archive Material*
—	History of ATV in South Australia		VK5KG	30	Colour	80	*Archive Material, still building*
—	ATV in Australia 1978 — made for British ATV Club		VK5KG	30	Colour	78	*Archive Material*
—	ATV in United Kingdom 1978 — reply from BATC		G8CJS	30	Colour	78	*Archive Material*
‡	Port Macquarie Field Day — 1983		VK2BFM	25	Colour	83	*Archive Material*
‡	VK2 75th Anniversary Seminar Keynote Speeches		WIA NSW	135	Colour	83	*Dr David Wardlaw & State Manager DOC*
©	Heard Island DX-peditions		Ch 2,7,9&10	20	Colour	84	*Archive Material: No Loan or Copy Available*
‡	Heard Island DX-pedition	VK2BCC	WIA NSW	60	Colour	86	*Raw Unedited; from 1986 VK2 Seminar*
‡	Opening of Amateur Radio House — NSW HQ	VK2BCC	WIA NSW	102	Colour	83	*Archive Material*
ANTENNAS AND PROPAGATION							
©	G6CJs Aerial Circus	G6CJ	WIA	90	B&W	77	*The Definitive Antenna Lecture: Loan Only*
—	Wire Antennas	VK5RG	VK5KG	40	B&W	78	*Antennas for HF and Antenna Tuners*
—	Loaded Wire Antennas	VK5NN	VK5KG	50	Colour	80	*Using Inductive and Capacity Loaded Antennas*
—	Getting Started in Understanding the Ionosphere	VK5NX	VK5ZBD	50	Colour	83	*How the Ionosphere Aids HF Communication*
‡	VHF Signal Enhancement by Aircraft	VK2ZAB	WIA NSW	70	Colour	86	*Raw Unedited; from 1986 VK2 Seminar*
‡	Antennas and Directivity	Guy Fletcher	OTC	73	Colour	85	*Lecture given to a group of radio amateurs*
‡	Antenna Rotator Systems	VK5AIM	VK5KG	50	Colour	86	*Servicing the several different types*
‡	Broadband Antennas	VK5RG	VK5KG	62	Colour	86	*Includes terminated antennas*
SPACE — GENERAL INTEREST							
—	Apollo 13 Disaster	VK5JM	VK5KG	90	Colour	80	*Australian Tracking Procedure Saved Apollo 13*
—	SSTV Pictures from Space — Voyager		VK5KG	15	Colour	83	*SSTV Pictures Converted from Saturn Fly-Past*
—	AUSSAT — Australia's Domestic Communications Satellite	VK5JM	VK5KG	62	Colour	84	*Technical Description of Services Offered*
‡	Amateur Radios Newest Frontier		ARRL	26	Colour	85	*Amateur Radio in Space; General PR*
‡	Working W5LFL in Orbit from VK10RR		Richard Elliot	23	Colour	86	*Raw Unedited Actuality Footage*
AMATEUR SATELLITES							
—	Getting Started in Amateur Satellites	VK5HI & VK5AGR	VK5KG	60	Colour	83	*Superseded (see below)*
—	An Introduction to Amateur Satellites (Part 1)	VK5AGR	VK5KG	60	Colour	84	*An Overview of Amateur Satellite Operation*
—	Micro-Computer Aids to Satellite Tracking (Part 2)	VK5AGR	VK5KG	30	Colour	84	*Programs for Tracking and Decoding Telemetry*
—	Using Phase 3 Amateur Satellites	VK5HI	VK5KG	90	Colour	84	*History, Construction and Use of High Orbit Satellites*
—	The AMSAT OSCAR Phase 3 Story	Dr Karl Meinzer DJ4ZC	VK5KG	80	Colour	85	*"The Father of OSCAR" includes film of the Launch*
‡	Antennas for Satellites	Dr Trevor Bird	WIA NSW	75	Colour	86	*Raw Unedited from 1986 VK2 Seminar*
DATA TRANSMISSION							
—	Getting Started in Amateur RTTY	VK5JM	VK5KG	85	Colour	83	*RTTY using Teleprinters and Micro-Computers*
—	Amateur Packet Radio	VK5AGR	VK5KG	60	Colour	84	*Theory and Demonstration*
‡	Packet Radio — 10 months on	VK2KYJ & VK2AAB	WIA NSW	65	Colour	85	*Raw Unedited from 1986 75th Anniversary VK2 Seminar*
‡	X.25 Protocols and Packet Switching	Barry News	OTC	47	Colour	86	*Lecture given to a group of radio amateurs*
AMATEUR COMPUTERS							
—	Demonstration of VK5RTVs Micro-Computer Controller #1	VK5KG	VK5KG	10	Colour	79	*First Micro-Computer Controlled Repeater in Australia*
—	Understanding Micro- Processors	VK5PE	VK5KG	60	Colour	80	*A Somewhat Dated Technical Description*
—	An ATV Ham-Shack Micro- Computer	VK3AHJ	VK3AHJ	10	Colour	81	*Describes now unavailable Micro-Computer Kit*
—	Getting Started in Amateur Micro- Computers	VK5IF	VK5KG	33	Colour	83	*Demonstration of Hard and Software for Amateur Radio*
AMATEUR TELEVISION: Technical							
—	The Signal to Noise Story	VK3ATY	VK3AHJ	45	Colour	82	*Superseded by "UHF Pre-Amplifiers" (see below)*
—	UHF Pre- Amplifiers	VK3ATY	VK3AHJ	45	Colour	83	*Explanation and Demonstration of Low Noise Pre-Amplifiers*
—	Getting Started in Amateur Television	VK5KTV	VK5KG	55	Colour	83	*How to Set-Up an Amateur Television Station*
—	Testing Amateur Television Transmitters	VK5KG	VK5KG	50	Colour	83	*How to Correctly Measure Amateur Television Systems*
*	High Definition Television Tutorial	Don Fink	WB2LLB	60	B&W	83	*A Look at What is to Come in Broadcast Television*
*	ATV Hamfest, York Pennsylvania, September 1983	Various	WB2LLB	360	Colour	83	*Various ATV Technical Lectures from USA*
AMATEUR TELEVISION: Activity							
—	ATV in Australia 1980/81 — Made for British ATV Club		VK5KG	60	Colour	80	*Clips from ATV Groups in VKs 2, 3, 4, 5, and 7*
—	ATV in United Kingdom 1978/81		G8CJS	30	Colour	81	*Re-make of their Previous Effort*
*	CQ ATV DX International 1983		WB2LLB	60	Colour	83	*ATV in USA and Europe*
	ATV in Victoria, 1984		VK3AHJ	54	Colour	84	*Courtesy of "The Roadshow Gang"*
AMATEUR TELEVISION: General Interest							
—	Low Definition Television	Chris Long	VK5KG	25	Colour	82	*Re-Creation of Television as Transmitted by Baird*
*	Overseas Television Clips about Amateur Television, etc		WB2LLB	60	Colour	83	*Broadcast Television Clips from USA and Europe*
—	Model Aero-Nautical Mobile ATV	VK5GO	VK5KG	6	Colour	83	*Amateur Television Camera and Transmitter Mounted in a Model Aeroplane*
‡	VK5RCN — Australia's First Wind Powered ATV Repeater	VK5KAU	VK5KG	61	Colour	86	*A Tour In and Around VK5RCN*
MISCELLANEOUS							
—	An Auxiliary Battery Charger	VK5NX	VK5KG	30	Colour	81	*Charging a Second Mobile Battery*
—	Lecture — Winning Fox- Hunts	VK5TV	VK5KG	45	Colour	81	*How to do it from one who has!*
—	Getting Started in Amateur Construction	VK5AIM	VK5KG	50	Colour	83	*Mechanical Hints for Novice Constructors*
—	Communication Consequences of Nuclear War	Dr John Coulter	VK5ZBD	60	Colour	83	*Why Your Gear May Not Survive, Even If You Do*
—	The Far Eastern Broadcasting Company		VK5KG	60	Colour	84	*How a Shortwave Broadcaster Operates*
—	The Australian "Over the Horizon Radar"	Dr Paul Whitham	VK5KG	60	Colour	84	*How the "Australian Woodpecker" Works*
—	What to Expect When the Radio Inspector Calls	Geof Carter DOC	VK5KG	34	Colour	84	*Geof is a Department of Communications Field Officer*

‡	**Doppler Direction Finding for Fox-hunters**	VK2BYY	WIA NSW	43	Colour	**85** *Raw Unedited from 75th Anniversary VK2 Seminar*
‡	**Fitting BNC Connectors**		OTC	7	Colour	**85** *Correct Assembly of Crimp Type BNC Plugs*
‡	**Handling Static Sensitive PCBs**	Paul Targent	OTC	6	Colour	**86** *Improving Reliability of Printed Circuits*
‡	**Extra License Grades**	VK2ZTB	WIA NSW	70	Colour	**86** *Raw Unedited; from 1986 VK2 Seminar*

NOTE:
© denotes Copyright: no copy service
‡ denotes New Addition
** denotes Optically Converted to PAL from NTSC by WB2LLB — noticeable flicker*
Standard Formats: Beta; Video 8 St & L Play; Dolby and Hi-Fi sound — please specify when ordering

John Ingham VK5KG
FEDERAL VIDEOTAPE CO-ORDINATOR
37 Second Avenue, Sefton Park, SA. 5083

Now *every* radio club can provide their members with quality technical lectures on subjects covering the whole range of amateur radio activities by taking advantage of the WIA Federal Videotape Library. You will find this a boon, particularly if yours is a country club which often has difficulty obtaining a variety of expert lecturers for regular meetings.

Individual amateurs and librarians should take note of the new Duplication Fees at the end of this article.

For radio clubs affiliated with the WIA, it is inexpensive and easy. Here is how it works:

Except for those titles for which the WIA does not hold a copyright licence, all you have to do is . . .

Supply the Videotape Co-ordinator with a videocassette of an available format

Enclose another stamped, return-addressed padded mailbag and the program is free for you to use in support of amateur radio in your area . . . including copying and transmission over the air if you wish

Those programs which are copyright are available only on loan. To obtain any of them send with your request . . .

Information about your preferred VCR format

A statement signed by a responsible officer of your club that "I undertake that while (Program Title) is assigned to me, I will not allow it to be transmitted over the air, nor copied by any means whatsoever, and that I will return the same promptly after showing".

A stamped addressed padded mailbag suitable for cassettes of your preferred format.

The present available formats are . . .

U-MATIC — size 260 x 173 x 40mm, mass 900 grams (to institutions only). Standard play — one hour maximum only. Standard sound only on channel 2 (No Dolby).

VHS — size 200 x 110 x 30mm, mass 350 grams. *Standard play four hours maximum, or long play eight hours maximum as requested. * Standard Sound — Dolby On or Off as requested. Hi-Fi FM Sound also present on all VHS cassettes.

BETA — size 160 x 100 30mm, mass 300 grams. Standard play three and a quarter hours maximum only. Standard sound only (No Dolby).

VIDEO 8 — size 103 x 68 x 20mm, mass 80 grams. *Standard play one and a half hours maximum, or long play three hours maximum as requested. Hi-Fi FM sound is standard (No Dolby).

Obviously, the smaller and lighter the cassette, the less postage.

* NOTE: Be sure to request Standard or Long Play, Dolby On or Off.

NOTE TO INDIVIDUAL AMATEURS

Since the inception of the WIA Federal Video Service, cassettes have been made freely available to all comers, especially isolated amateurs. However, recently there has been a rapid rise in the number of requests from individual amateurs, some asking for over 10 hours of programs at one time.

Video duplication is a real-time, one-at-a-time operation for which the costs of maintenance of the equipment is not small. Obviously, the Service is much more economical if, say, one tape is seen by 30 members of a club than if each of the 30 members were to request their own personal copy. If every member of the WIA requested just one program, it would take about four years at 40 hours a week to service!

So, in an effort to encourage requests from groups of amateurs rather than individuals, from now-on a Duplication Fee of $2 per hour, or part thereof, will be payable in advance for all requests from individuals. All such fees will go towards upkeep of the duplication equipment.

NOTE TO LIBRARIANS

A number of educational institutions have already availed themselves of the technical lecture tapes from the WIA. While this service will continue to be available, from now-on a Duplication Fee of $10 per hour, or part thereof, will be payable in advance by all institutions not affiliated with the WIA. All such fees will go towards the production costs of future Technical Lectures.

ar

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MIRAGE

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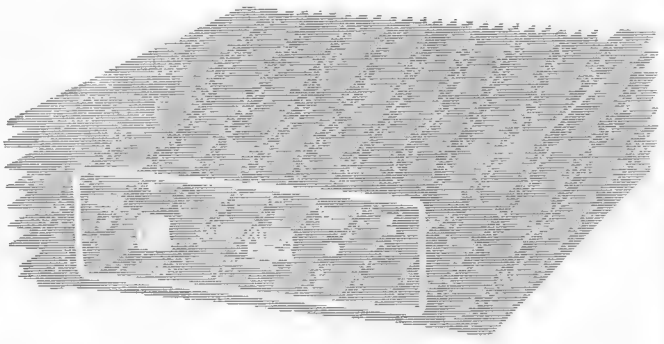
B23A	144-148 MHz AMP 2W IN 30W OUT
B23S	144-148 MHz AMP 2W IN 30W OUT
B108	144-148 MHz AMP 10W IN 80W OUT
B215	144-148 MHz H/T AMP 2W IN 150W OUT
B1016	144-148 MHz AMP 10W IN 160W OUT
B3016	144-148 MHz AMP 30W IN 160W OUT
D24N	430-450 MHz AMP 2W IN 40W OUT — TYPE "N" CONNECTOR
D1010N	430-450 MHz AMP 10W IN 100W OUT — TYPE "N" CONNECTOR
D3010N	430-450 MHz AMP 30W IN 100W OUT — TYPE "N" CONNECTOR
MP1	HF WATTMETER 1.8-30 MHz
MP2	VHF WATTMETER 50-200 MHz
RC-1	REMOTE CONTROL/18 FOOT CABLE



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Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

MARCH	
1	French Phone Contest (concludes)(Rules February issue)
2	YLRL YL-OM CW Contest (concludes)
7- 8	ARRL DX Phone Contest
7- 8	QCWA Phone QSO Party
14-15	John Moyle Memorial Field Day Contest (Rules February issue)
14-15	RSGB Commonwealth Contest (Rules December issue)
21-22	YL ISSB Phone Party (Rules February issue)
21-23	BARTG Spring RTTY Contest
28-29	CQ WW WPX SSB Contest

At this time I do not have details or rules for any contests which will be held during April. I would simply suggest that, if you are interested, look at the calendar for April last year.

I have been advised that the *Commonwealth Contest* is scheduled for March 14 and 15. This, unfortunately, clashes with the John Moyle Memorial Field Day Contest, the date for which was decided upon around the middle of last year (1986). It was necessary that the date for the Field Day Contest be decided at that early stage due to arrangements necessary in connection with simultaneous running of the NZART Field Day Contest.

For some reason the organisers of the Commonwealth Contest have never provided details of dates of this contest to the WIA Federal Contest Manager. It may be that details will have been provided separately to the magazine via another source as has happened in the past. It could well be of benefit if something more positive could be sorted out on this contest in the future, however, I have not had time to chase this matter up as yet. This situation is unfortunate, particularly as I am led to believe that this year is the Golden Anniversary of the Commonwealth Contest.

There does not seem to be very much news on the contest scene for this issue. By the time you read this it will be close to the Annual Federal Convention. One of my tasks will have been to produce my Annual Report, together with whatever recommendations which need to be made to the Federal Council regarding running of contests. Last year I had asked whether some action could be initiated to obtain suitable prizes which could be given to winners of various contests. I have not heard of any results of possible approaches to potential donors of such prizes or plaques, although I am still hopeful that something along such lines can be arranged. Maybe there are some amateur radio equipment suppliers out there somewhere who might read this and be prepared to contribute in some way.

I do hope that members will make themselves familiar with details of agenda items for the Federal Convention which are supplied to each Federal Councillor and that, as a result, a healthy discussion will have ensued regarding not just contest matters but all those matters which of necessity must be addressed if we are going to continue with amateur radio in this country along well devised lines. Please remember that it is only through your interest and support of your own organisation that we can achieve the success we all desire. Running off in other directions and screaming does no good whatsoever and, in fact, can cause harm to our hobby. I would refer you to a recent letter which was printed in the New Zealand magazine *Break In,* a copy of which appeared in this magazine just a few months ago in which I pointed out that, whether or not you like it, the WIA is the organisation which is officially recognised by the Australian Government as representing the amateur radio operator in this country. It thus behoves us as individuals to make ourselves properly aware of the true facts pertaining to the Amateur Radio Service in this country and not to go about spreading mis-information as has happened where other sources other than the WIA purport to be authoritative and claim to have the answers to the problems our hobby may face.

The comments I have made apply certainly to the subject of running of contests and, indeed, to all of the aspects of amateur radio as well. I would encourage your input and comment to your selected representatives as I believe that we should have a well informed, united and healthy organisation to represent what I believe is one of the best hobbies in the world. You can make your organisation work for you if you are prepared to take an interest in it.

I trust that there will be a good number of stations operating in the John Moyle Memorial Field Day Contest.

Many of you may not be aware of just who John Moyle was. A short resume regarding John, who held the call sign VK2JU, has appeared from time to time in the Call Book. John was a most knowledgeable man and, amongst other things, was a good administrator, had a wide technical knowledge and also acted as editor for the magazine *Radio & Hobbies,* which was the name given to the publication now known as *Electronics Australia.* (Incidentally, for a time it was also named *Radio, TV & Hobbies*).

I can remember very well the days around the mid 1950s when the familiar situation occurred where our bands were in danger as a result of Government policy and a forthcoming World Administrative Radio Conference. Much activity ensued within the amateur ranks with people such as Max Hull VK3ZS, making rapid trips back and forth between Melbourne and Canberra in attempts to lobby politicians and members of the bureaucracy in the interests of amateur radio. It was John Moyle who was chosen to be our representative in Geneva based on his great and proven ability. John went willingly, but carrying with him a burden which very few people ever knew about. By sacrificing the time he spent away in our interests, John showed his desire to help when he could have been spending some of his last days with his family and loved ones. John Moyle was, in fact, suffering from a terminal cancer condition, and whilst he knew it, he did not let on to any but a select few. Even today, this fact is little known. It is therefore, quite fitting that such a contest as John would have approved of should be named in his memory.

This year, once again, our Field Day Contest coincides with the NZART Field Day Contest. This is, of course, by design and resulted from consultation between myself and Jock White ZL2GX, who is the ZL Contest Manager. Whilst the New Zealand contest operates under somewhat different rules, it has been made possible for our Field Day stations to contact the ZL Field Day stations and score additional points for such contacts. I would suggest that you make sure that you fully understand the rules of the contest before commencing operation. They are altered very little from last year.

It may be as well for me to point out that, unlike the rules for our contest, the ZL Field Day stations may only work other *Portable stations.* This thus precludes such as *Home Stations* from contacts with them. The modification of our rules and the coinciding of the two contests should provide added interest for both the Australian and New Zealand field day operators.

Whilst on the subject of field days, I would appeal to all who venture out into the wilds, etc to pay heed to a few safety aspects of their activities. First of all, in connection with generators. Please make sure that you clear away from around your petrol and diesel powered generators any inflammable materials such as grass and twigs and also ensure that your fuel containers are not placed too close to a hot engine. I suggest too that you take great care when re-fuelling as hot engines and gasoline poured about the place can result in a very volatile mixture. We certainly do not want to see anyone come to harm as a result of what should be a fun-type of amateur radio event and we also do not wish to be the cause of bushfires either. Fuel containers should not be left exposed to heat or direct sunlight, so place them in the shade somewhere.

I would also suggest that in many cases it is advisable to peg the generator into position on the ground as often vibration can cause the unit to *walk* and thus move it out of the area which you may have gone to all the trouble of clearing in the interests of safety.

Another most unpleasant occurrence is that of receiving an electric shock. So remember that even portable generating equipment is quite capable of producing same and that such can cause death.

Please ensure that you are properly aware of the requirements for earthing of such devices, both at the generator end and at the transmitting end of the line. Portable earth leakage detector devices properly installed can play a very useful role here.

On the subject of power lines, I might make the observation that you should be most careful also when erecting any masts, antennas and the like near existing overhead power lines. Contact with such can indeed be fatal. Another tip regarding power cabling is in connection with the lead from the generator to the radio equipment. I would suggest that this lead be as heavy as practicable and also that it should be as long as you can reasonably make it. The heavier the cable means less voltage drop whilst placing the generator a reasonable distance away from the equipment cuts down acoustic noise from the engine and, if placed away from antennas and receivers, the likelihood of annoying ignition interference is also reduced.

There are many other aspects of field day operation which I could refer to, including the need for safe travel to and from the field day site, so you can see that there is a little more to it than just rushing out and doing it. A successful field day operation is more likely if it is properly thought about and planned in advance. So, I hope that the short two weeks or so from when you read this will allow you sufficient time to take yet another look at this aspect of what can be a very enjoyable contest.

When you send in your log entries, I would appreciate some photographs of your activities for publication purposes as well as some short write-up as to the experiences you had. Have fun in the field day — I will be looking forward to making contact with you during same.

You might also bear in mind the possibility of using your field day contest operation to improve the public relations image of amateur radio. Invite your local newspaper or television station to visit your site.

As I write this, the Ross Hull Contest finished just two weeks ago. Up until now I have only received four logs. Included already in the comments received are reports of very little activity. I hope that this will not turn out to really be the case as a lot of work and effort has gone into trying to make this contest more attractive to a larger number of operators. Again, I would state quite frankly, I do wonder at times whether anybody, apart from the few stalwarts who do write to me expressing their opinions, is really interested in what happens with the Ross Hull Contest. Despite putting in time producing a discussion paper and circulating it to all Divisions, I have not received a written reply from any other than the VK5 Division. Perhaps a direct mention of this nature might spur some member/s to query their Council and Federal Councillor as to what they have done about this matter. I can assure you that it does not feel nice to have so many requests for comments ignored particularly when the requests have been made in as polite a manner as possible. Perhaps

one has to accept the fact that in this community the lack of manners has become a normal part of the scene.

The Discussion Paper referred to was circulated to all Divisions back in May 1986, and was also printed in this column so that members in general could become informed and to allow them to express their opinion to their Divisional Councils.

HF CONTEST CHAMPIONSHIP 1986

Provided below are the details of points scored to date in both the Phone and CW sections of the Contest Championship competition for the 1986 contest year. The rules for this contest require that the entrants have participated in at least three of the four HF contests organised by the WIA each year. The contests are:

Field Day, VK Novice, Remembrance Day and VK/ZL Contests.

To date results are available for the first three contests listed. The final results cannot be determined until the results of the 1986 VK/ZL Contest become available. The VK/ZL Contest organisation was undertaken by New Zealand for 1986. I am not aware at this stage as to when the results of the contest are likely to become available. I have listed the points score for the HF Contest Championship for only those stations which have entered at least two of the nominated contests to date. Points are awarded on the basis of 10 points for first place in a contest, nine points for second down to one point for 10th place. These points are awarded and listed on a call area basis.

HF CONTEST CHAMPIONSHIP SCORES 1986

PHONE

CALL SIGN	FD	RD	NOV	TOTAL
VK1LF		8	10	18
VK1RH		1	9	10
VK3DOM		9	9	18
VK3ZI		8	5	13
VK3YH		7	8	15
VK5QX	10	10	9	29
VK5SJ	10		10	20
VK5ATU		5	8	13
VK6ED		8	8	16
VK7NCP		7	10	17
VK7NAI		4	9	13
CW				
VK2DQP		5	9	14
VK2AZR		1	8	9
VK3CGG	10	10	10	30
VK3XB		9	7	16
VK3NK		8	9	17
VK3KS		6	8	14
VK4BRZ		6	8	14
VK4VAT		4	10	14
VK5AGX		9	10	19
VK6AFW		10	10	20

At the December meeting of the South Australian Division I had much pleasure in presenting the Contest Championship Trophies for 1985 to the winners, namely Bob VK5BJA for Phone and Lindsay VK5GZ for CW. This presentation was, however, made only in *symbolic* form as the new trophies for the competition sections have yet to be made available. The Federal Office is currently arranging for the two new trophies to be made. I believe that they will be somewhat unique in design and also particularly appropriate as amateur radio trophies. We will await their provision with great anticipation. I would hope to be able to have a photograph of them published in the magazine in the near future.

Meantime, those concerned can expect to receive small trophies suitably engraved for them to keep.

Well, despite the fact that there did not seem to be very much in the way of news for this month, preparation and typing of the material seems to have taken quite an amount of time.

Once again, all the very best in the Field Day and also in all of your other activities.

—73 de Ian VK5QX.

COMMONWEALTH CONTEST

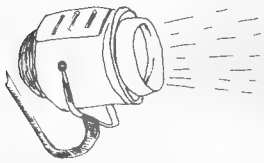
Commonwealth Contest (BERU) regulars are reminded that the contest will run from 1200 UTC March 14, to 1200 UTC March 15.

John Tutton VK3ZC, requests that in the couple of weeks preceding the contest, overseas Commonwealth stations, as well as locals, when contacted, are asked to come on for this, the 50th Anniversary Contest.

GB5CC, operated at RSGB HQ, will be a bonus area of its own, workable by Gs and overseas stations alike.

The medallions for the leading VK entrant and the state team of four will again be up for competition rules — see December AR, P38.

—Contributed by John Tutton VK3ZC



Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Well, a quarter of the year has almost gone! It truly amazes me how rapidly time flies as one gets older.

Last month, I reported on the appearance of several clandestine stations in Malaysia and Sri Lanka. The *Voice of the Malaysian Revolution,* which supports the tiny guerrilla bands on the Thai-Malaysian border, has not been heard lately. It was on a nominal frequency of 7.055 MHz on AM, yet it was far from being stable, as it was varying in frequency with the modulation. It may be back on the air by now, and I somehow suspect that the sender packed it in.

The other station was the *Voice of Tamil Eelam* which is thought to be either on the Jaffna Peninsula of Sri Lanka or, probable in SE India. It has now re-timed its broadcasts to 1400 UTC and is still on 7.010 MHz. Patrick McDonald, in Sydney, has been observing the station.

Another clandestine that has been around for a couple of years now is widely believed to be in Transvaal in the RSA. *Radio Truth* broadcasts in English and two African languages, spoken primarily in Zimbabwe. So it is quite easy to deduct where the target audience is. On December 9, it announced that it would be on 3.370 MHz in the local morning and evening hours; ie 0400 and 1700 UTC. This was according to the BBC Monitoring Service. But this does not appear to be the case, as Patrick McDonald, in Dural, heard it on December 19, at 1756 on 5.015 MHz. A Brisbane DXer, Robert Shepherd, also heard it on December 21 at the same time. Rather ineffectual jamming was also noted. Interestingly enough, when the programming concluded, the transmission continued with numbers being read out in Afrikaans, which is the language of the South African white community.

I have been following the propaganda war in the Iran-Iraq conflict, which has been going on for over six years now. Reportedly over one million casualties on either side has deterred the combatants from negotiating peace. Both sides appear intransigent and have been extensively using shortwave radio in their propaganda battle. They also severely jam each other, with the Iraqis winning there!

The number of channels have increased on the Iraqi broadcasts, indicative of new transmitters. Iran is following suit and aims to have 50 transmitters devoted exclusively to Foreign Service programming from four sites. This will, presumably, increase the number of Middle Eastern signals, which are already getting quite numerous. This new QTH in West Launceston appears to be better for signals from that region, than in Newstead. This is probably due to the antenna bearing plus I am several hundred feet higher.

Incidentally, you can readily identify the Iraqi jammers by their high, whistling pulse; eg 7.105 MHz around 0500 and 1300 UTC. This is usually placed on Iranian broadcasts to Iraq, but other nations are also periodically jammed, dependent on the Iraqis are going on the battle-front. 3.774 MHz is an Iranian frequency which usually carries domestic programming yet has come under Iraqi jamming, when they broadcast in Arabic.

It is interesting to hear the two protagonists on radio with martial music and interspersed with sounds of gunfire. Around 0900 UTC you will find the two fairly close together in the 19 metre band. Teheran is on 15.084 MHz, in Farsi, (Persian) and Baghdad is on 15.105 MHz in Arabic. The Iranians on 15.084 have been there for some time, with a French built 300 kW transmitter, but they have apparently been unable to acquire the expertise or spare parts to maintain the senders, as the audio was horribly distorted. They have apparently been able to clean the transmitted signal up recently, for it is much better now.

Other Middle Eastern nations are nervously watching the conflict, particularly Kuwait, which is near to the fighting. You can hear Kuwait, in Arabic, very well on either 9.840 or 15.495 MHz around 0500 UTC. Another station that gives impartial information on the Gulf War is *United Arab Emirates Radio* in Dubaii. They can be heard in English at 0530 UTC on 21.700 MHz, which I use as a beacon for Middle Eastern propagation on 15 metres.

There are other stations that the Iranians repeatedly try to jam. There are also many exile groups who utilise senders of some Middle Eastern governments to broadcast back into Iran. Many have been traced back to Egypt. One regular was *Radio Vatan* which was audible on 9.027 MHz and was five kilohertz above Teheran on 9.022 MHz. It was also on 15.555 MHz but has since changed its call, as there has been a combined united front formed of the various anti-Komeni forces, with the notable exception of the Tudeh, who have their own programming from Turkmen SSR and Azerbaijan SSR.

On Sunday, March 1, most international stations make some frequency alterations, because of the seasonal propagational fluctuations. Some stations that broadcast programming to Europe also change the timing to take account of the introduction of Daylight Saving in Europe on March 29. Most programs are on local time rather than UTC, consequently programs are one hour earlier. Also the USSR alter their domestic and foreign service frequencies on April 1, when they go onto Summer Time. All these alterations certainly make it difficult to make a reliable band plan. Incidentally, Daylight Saving finishes on March 15, in Australia and on March 1 in New Zealand. The US commences theirs on April 26.

There have been reports that there are three locations of the Soviet Woodpecker. The first one is at Gomel in Belorussia; the second in the Caucasus Mountains and the third at Nikoleysk an-Amur in the Far East, opposite the northern tip of Sakhalin Island.

Well, that is all for March. Until next month, the very best of listening and 73.

—Robin VK7RH.

International News

IARU INTERNATIONAL CONTESTS

Society	Region	Title	Mode	How Date Decided	1987	1988	1989
MRASZ	1	HA DX	CW	Third full weekend of January	17-18	16-17	21-22
UBA/REF	1	French	CW	Last weekend of January	24-25	30-31	28-29
RSGB	1	7 MHz	Ph	First full weekend of February	7-8	6-7	4-5
VERON	1	PACC	CW/Ph	Second full weekend of February	14-15	13-14	11-12
RSGB	1	First 1.8 MHz	CW	Second weekend of February	14-15	13-14	11-12
SRJ	1	YU DX	CW	Second full weekend of February	14-15	13-14	11-12
RSGB	1	7 MHz	CW	Third weekend of February	21-22	20-21	18-19
ARRL	2	International DX	CW	Third full weekend of February	21-22	20-21	18-19
UBA/REF	1	French	Ph	Last weekend of February	21-22	27-28	25-26
ARRL	2	International DX	Ph	First full weekend of March	7-8	5-6	4-5
PZK	1	SP DX	CW	First weekend of April	4-5	2-3	1-2
RSF	1	Yuri Gagarin	CW	Second full weekend every third April	11-12		
RSGB	1	Low Power	CW	Second Sunday of April	12	10	9
USKA	1	Helvetia	CW/Ph	Last full weekend of April	25-26	23-24	29-30
RSF	1	CQ M	CW/Ph	Second weekend of May	9-10	14-15	13-14
URE	1	Ibero-America	Ph	Last full weekend of May	30-31	28-29	27-28
LABRE	2	World Telecom Day	CW/Ph	Last weekend in May (CW Saturday, Ph Sunday)	23-24	28-29	27-28
DARC	1	Field Day	CW	First or second weekend of June	6-7	4-5	3-4
JARL	3	All Asian DX	Ph	Third full weekend of June	20-21	18-19	17-18
RSGB	1	Summer 1.8 MHz	CW	Last weekend of June	27-28	25-26	24-25
RCV	2	YV DX	Ph	First full weekend of July	4-5	2-3	1-2
IARU	1, 2, 3	HF World Championship	CW/Ph	Second full weekend of July	11-12	9-10	8-9
LCRA	2	HK DX	CW/Ph	Third full weekend of July	18-19	16-17	15-16
MARTS	3	SEA Net	CW	Third full weekend of July	18-19	16-17	15-16
RCV	2	YV DX	CW	Fourth full weekend of July	25-26	23-24	22-23
FRR	1	YO DX	CW/Ph	First weekend of August	1-2	6-7	5-6
DARC	1	European DX	CW	Second weekend of August	8-9	13-14	12-13
WIA	3	Remembrance Day	CW/Ph	Weekend nearest August 15	15-16	13-14	12-13
MARTS	3	SEA net	Ph	Third full weekend of August	15-16	20-21	19-20
JARL	3	All Asian DX	CW	Fourth full weekend of August	22-23	27-28	26-27
IARU Region	1	Field Day	Ph	First weekend of September	5-6	3-4	2-3
BFRA	1	LZ DX	CW	First Sunday of September	6	4	3
DARC	1	European	Ph	Second weekend of September	12-13	10-11	9-10
EDR, SRAL, NRRL, SSA		Scandinavian Activity	CW	Third weekend of September	19-20	17-18	16-17
CRRL	2	Can-Am	CW/Ph	Third weekend of September (Ph Saturday, CW Sunday)	19-20	17-18	16-17
EDR, SRAL, NRRL, SSA		Scandinavian Activity	Ph	Fourth weekend of September	26-27	24-25	23-24
WIA/NZART	3	VK/ZL Oceania	Ph	First weekend of October	3-4	1-2	7-8
RSGB	1	21/28 MHz	Ph	Sunday of second full weekend October	11	9	15
RKDDR	1	Worked All Y2	CW/Ph	Third full weekend of October	17-18	15-16	21-22
WIA/NZART	3	VK/ZL Oceania	CW	Third weekend of October	17-18	15-16	21-22
RSGB	1	21 MHz	CW	Sunday of third full weekend of October	18	16	22
DARC	1	European DX	TY	Second weekend of November	14-15	12-13	11-12
CRCC	1	YO DX	CW/Ph	Second Sunday of November	8	13	12
RSGB	1	Second 1.8 MHz	CW	Second weekend of November	14-15	12-13	11-12
OVSV	1	All Austria	CW	Third weekend of November	21-22	19-20	18-19
URE	1	EA DX	CW	First full weekend of December	5-6	3-4	2-3
ARRL	2	160 Metre	CW	First full weekend of December	5-6	3-4	2-3
ARRL	2	10 Metre	CW/Ph	Second full weekend of December	12-13	10-11	9-10

Compiled on November 17, 1986.

SPECIAL CALL SIGN

PA6IARU will be a special event call sign used during the Region 1 IARU conference to be held in the Netherlands from April 9-20, 1987.

—*The ARRL Letter,* December 23 1986

JAPAN AMATEUR RADIO LEAGUE

Reciprocal operating arrangements have been successfully concluded between the Department of Communications and the Japanese Administration and came into effect on February 25, 1987.

From this time, the JARL will act as a proxy for licensing procedures for alien radio amateurs as the application should be translated to Japanese characters.

Application procedure for short term amateur radio license in Japan

1. DOCUMENTATION

Submit the following documentation with your application.

1 Completed station information form JARL-86-01.
2 Signed letter of attorney allowing JARL to submit the application on your behalf.
3 Photocopy of the photograph page of your passport or equivalent proof of citizenship. (If not immediately available, you may submit it be separate mail before arrival in Japan.)
4 Photocopy of your current amateur radio license.
5 International money order for fund due, or a copy of a bank transfer documenting the funds have been transferred to Japan.

2. SUBMISSION

The application must be submitted at least 60 days prior to your wish to start operation in Japan. Submit your application to:

The Japan Amateur Radio League, Attention: International Section, 14-2, Sugamo 1-chome, Toshima-ku, Tokyo 170, Japan. Tel: 81-3-947-8221.

3.LICENSING INFORMATION

1 Station output power is used to classify amateur radio stations in Japan. It is recommended you request a portable 50 watts station for use anywhere in Japan.
2 A separate license is necessary for establishing a fixed station in addition to a portable 50 watt-or-less station. A fee is charged for each license.
3 After the application is approved, your Japanese amateur radio license will be forwarded to the Japanese mailing address described in Item 6 of station information (JARL-86-01).
4 You may use the JARL address for Item 7 if you chose mobile/portable station, and you can receive your license at the JARL office in Tokyo by presenting your passport, or other kind of ID. In this case, please state: *Hold my license at JARL* in Item 6.
5 Station licenses will be granted for a period of one year, but in any case not beyond the expiration date of your current amateur radio station license.
Five year station licenses are available for alien permanent residents of Japan who provide proof of residence status with your application.
6 Payments can be made by International Money Order payable in Yen to the JARL or by bank transfer to the JARL account:
Mitsubishi Bank, Komagome Branch, Tokyo, Japan. A/C No: 061-9003391. Beneficiary's name: Japan Amateur Radio League. Reason for remittance: Reciprocal Amateur Radio License.
7 The fees payable for station licenses are:
10 watts or less 10 000 Yen (mobile/portable)
More than 10 watts, but 50 watts or less 13 000 Yen (mobile/portable)
More than 50 watts, but 100 watts or less 19 000 (fixed only)
8 Different application procedure is necessary if you plan to run more than 100 watts output. Applications must be made directly to the Telecommunications Administration Bureau (TAB) in the call district in which you will reside during your stay in Japan. After approval by TAB, you must go through on-site inspection of your station by TAB before being granted a license. This procedure may take more than three months. Please contact us beforehand for more details.

Under the Ministry of Posts and Telecommunications regulations, Australian amateurs who hold a valid DOC license have the following privileges in Japan.

LICENSE CLASS	EQUIVALENT JA LICENSE	AUTHORISED MODE/BANDS	MAXIMUM POWER
Full	1st Class	All modes on all bands	500 watts
Limited	Limited 1st Class	All modes except A1A and A1B on frequency bands above 50 MHz	500 watts
Novice	Telegraph Class	All modes on all bands except 10 and 14 MHz	10 watts

For further information contact the Federal Office of the WIA.

—Contributed by Yutaka Kasahara JA1CLN, Manager External Affairs, JARL

AMSAT Australia

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8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletins Commence: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
Control: John Browning W6SP
Bulletins Commence: 2200 UTC Saturday
Frequency: 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

ACKNOWLEDGMENTS
Contributions this month are from Bob VK3ZBB, and the American Radio Relay League (ARRL) magazine *QST* January 1987. Thanks must also go to Ross Forbes WB6GFJ, for drawing my attention to this material.

On page 24 of the January 1987 issue of *Amateur Radio,* under the title of *QSP — Geosynchronous Study Plan* mention was made of AMSAT's Vice-President of Engineering, Jan King's Phase 4 Technical Study Plan. In the January issue of *QST* Jan wrote an article entitled *OSCAR at 25: Beginning of a new Era.* From that I quote. . .

What will Phase 4 be like? How will it be to use? According to the preliminary (strawman) concept, initially there will be two satellites placed in geosynchronous orbits. The coverage areas (footprints) of each are shown in Figures 1 and 2. AMSTAR East would be positioned over the equator at 46.6 degrees west. (AMSTAR is a preliminary designation for AMSAT's Phase 4 satellites). From there, it would cover everything east to Helsinki and Durban and west to Seattle. AMSTAR West would cover everything from Boston west to Tokyo and central Australia. Although, technically difficult, it might be possible to link the two birds (crosslink) in such a way as to enable a two- satellite QSO from say, Athens to Melbourne.

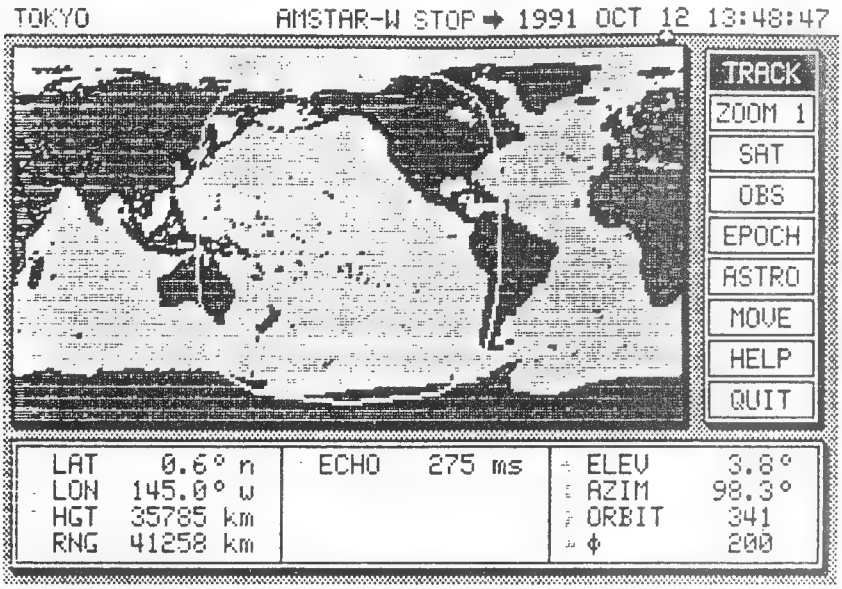

Figure 2 — Footprint of AMSTAR West (see text).

What is especially attractive about the geosynchronous orbit is that the old bugaboo about tracking is gone completely! You just set your antenna at a given spot in the sky and, essentially, weld it in place. You never have to move it: no computers, no locators, no nothing; just AMSTAR in the sky 24 hours a day, 365 days a year, providing the kind of facility emergency communicators and ordinary would-be satellite users have been seeking for years.

What kind of communications services might be enabled by Phase 4? Let us look at the various transponders and examine briefly their capabilities (see Figure 3.)

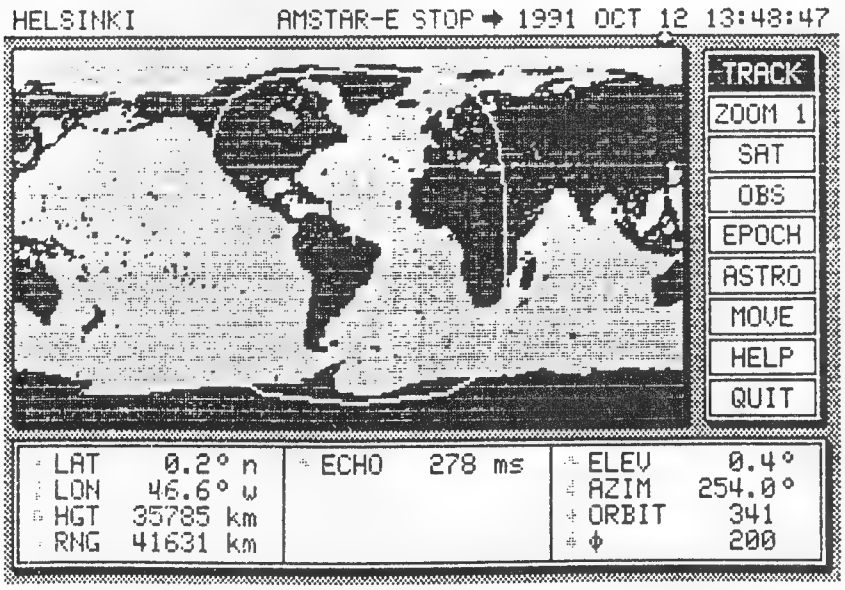

Figure 1 — Footprint of AMSTAR East (see text).

MODE JL

Mode JL is a combination of two modes (J and L) that have been used previously for OSCARs. Mode J (named for JAMSAT, our Japanese colleagues) first flew aboard AMSAT-OSCAR 8 during 1978 in a project sponsored by ARRL. Mode J has recently been reborn with its employment on the new Fuji-OSCAR 12 from Japan. As may be seen in Table 1, Mode J involves a two metre uplink and a 70 cm downlink. Mode J is especially popular in Japan because intense two metre QRM makes reception of relatively weak two metre downlink of, for example Mode B (70 cm up, two metres down) very difficult. On the other hand, the 70 cm downlink is not subject to comparable QRM levels in Japan.

Mode L is a relatively new mode, having flown on AMSAT-OSCAR 10 in 1983 for the first time. With 24 cm uplink and 70 cm downlink and fully 800 kHz of bandwidth, it was designed as a safety valve to absorb anticipated growth on AO-10's Mode B. That growth eventually did reach a stage where it would have likely spurred Model L use, except that the Model L transponder developed sensitivity problems. It was infrequently used for communication and occasionally for experimental purposes.

The combined Mode JL will have its first space test next autumn when the latest Phase 3 satellite, Phase 3C, is launched. With Mode JL, two metre and 24 cm uplinks each result in 70 cm down links. Given the user equipment shown for Mode J in Table 2, the SSB user can expect an average downlink signal-to- noise ratio (S/N) of 10.5 dB (see Table 3). Mode L users do a little better on average with about 11.3 dB S/N ratio on SSB. Peak S/N (the best measure of signal quality in the short term) would be a very respectable 21.5 dB and 22.3 dB for the J and L links, respectively.

MODE S TRANSPONDER

Mode S will also fly on Phase 3C next autumn, but it will be a 70 cm to 13 cm version of Mode S and have only limited bandwidth (25 kHz and power of 1.3 watts). On Phase 4, however, Mode S will comprise of a special 24 cm up and 13 cm down transponder. The Phase 4 Mode S transponder is envisaged to comprise four sub-transponders, each with its own AGC loops and function. Let us

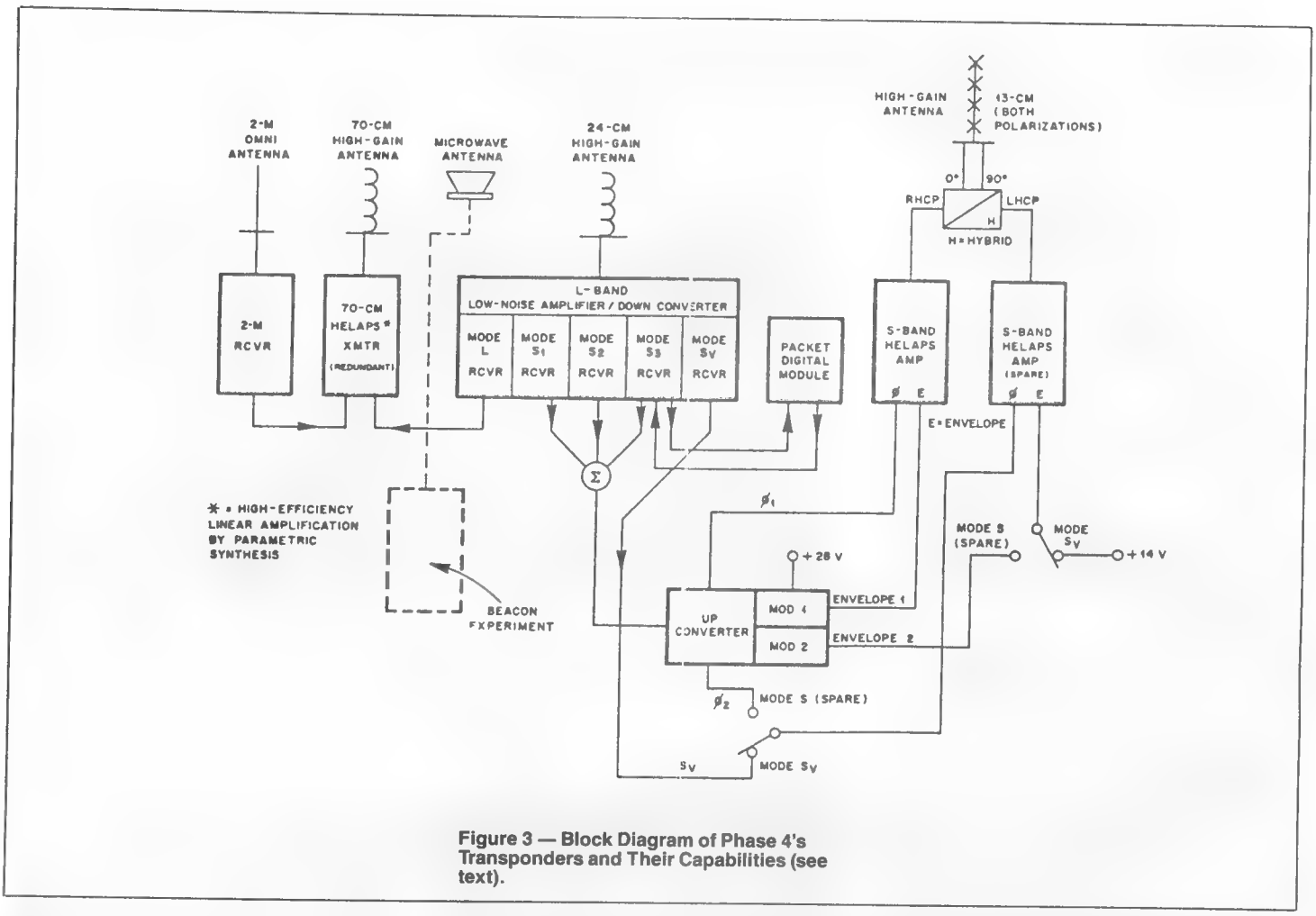

Figure 3 — Block Diagram of Phase 4's Transponders and Their Capabilities (see text).

look at the function and performance of each of these sub-transponders in more detail (refer Figure 3).

S1: General Linear Communications Transponder

The S1 sub-transponder will be used for the traditional type of OSCAR communications most users are currently accustomed to. Essentially, there will be 100 kHz of linear transponder passband for the normal Frequency Division Multiple Access (FDMA) use OSCAR users have been employing since AO-6 days. With 100 kHz, there is ample room for about 25 to 35 QSOs, depending on how well they are "packed" or "stacked". If there are three or four individuals per QSO, as there often are in satellite QSOs, about 100 simultaneous users could be accommodated in this S1 transponder. S1 performance would average about as good as AO-10 got at its best: S/N of about 13.4 dB. Moreover, under ideal conditions S1 could deliver 24.4 dB S/N, peak (see Table 3). In order to realise the specified user S/N, the Mode S1 user equipment suite (or better) would be required. As seen in Table 2, it consists of a 1.5 metre (5 foot) parabolic dish antenna with a dual 24 cm/13 cm feed. A 10 watt average uplink transmitter would produce 1000 watts EIRP using the recommended 23 dB dish gain at 24 cm.

S2: Gateway Interconnect

The S2 transponder will potentially provide one of the most important services as well as one of the most dramatic. S2 will be a gateway interconnect transponder. A gateway is simply a portal from one type of network to another. A terrestrial voice repeater can be viewed as a network — a network of users with radios clustered around and interconnected through the repeater. Similarly, the satellite users can be viewed as a network. Interconnection of these networks is accomplished through a gateway. In this context a gateway could be a repeater equipped with an interface to the satellite. That is an uplink transmitter, a downlink receiver and associated interface and control circuitry. Functionally, the gateway serves to extend the repeater user's telecommunication into the satellite's network of users, and vice versa. Ideally, the interface would be transparent; that is, a user in either domain (terrestrial repeater user community or satellite user community) could be totally unaware of the existence of the facilitating gateway. Furthermore, by extension, a terrestrial repeater user linked to the satellite through a gateway could then be further linked through the satellite to a second gateway and its respective user community. Again, if the links were executed properly, users on either end of the dual gateway circuit could be unaware of the extended circuit supporting their QSO.

But there is much more to this gateway arrangement than novelty. Sure, it is amusing to visualise a pair of two metre hand-held radio users half a globe apart enjoying a pleasant chat, describing their radically different scenes before them. But, because of the very disposition of equipment within the gateway arrangement, gateway operations using combinations of terrestrial repeaters, linked via satellite, offer an extremely important approach to emergency communications.

A portable gateway established at a major flood or earthquake site could, for example, link the disaster reaction team to major relief organisations. Support and logistics control could be organised on an unprecedented level. On-scene leaders could communicate instantly with virtually any other QTH in the hemisphere 24 hours a day. A single hand-held radio hiked to a mountain- top airline crash could communicate directly with state and federal authorities using a gateway on a nearby mountain-top. Establishment of DX communications for local or regional emergency centres could be as simple as implementing the gateway to the continuous coverage satellite/s.

Aside from the unprecedented potential for saving lives and property, gateway facilities would be available for more mundane use between selected repeaters on a daily basis. A limited number of repeater gateways would be authorised access for these routine QSOs when there were no emergency operations underway or if adequate spectrum sharing schemes were to be established. So one age-old fantasy many amateurs have harboured of having freedom of movement (being mobile or even foot-mobile) while engaging in a DX QSO would be realised simultaneously with the penultimate emergency communications resource.!

Moreover, because the real communications "work" involved in communicating the 71 400 km (44 400 miles) or to/from the geosynchronous satellite is accomplished by the gateway, the equipment burden on the gateway user is reduced to an absolute minimum — essentially, only what is needed to communicate over the distance to and from the local gateway/repeater. And that could even be done in some cases with one of these new, ultra-miniature 100 mW hand-held rigs now on the market. For a community of terrestrial repeater users who have an interest in linking their repeater to others across the continent, it makes sense to pool their resources to establish a single gateway for the long-haul to/from the satellite, rather than each individual undertaking the cost. Thus, Time Division Multiple Access (TDMA) system for communicating with the world outside their local repeater community on a given "channel", one of several FDMA channels available.

Compare this TDMA access to the FDMA access users of the S1 transponder enjoy. The S1 FDMA user undertakes his own uplink/downlink burden. It costs him the equipment required to establish the link. For this investment, he obtains

time-independent use of the S1 linear transponder; ie he can use it whenever he cares to. On the other hand, the gateway TDMA user, having pooled the uplink/downlink resource in the form of the gateway equipment, may have to queue up to use the resource; ie wait until it is free for his use. Thus, he has reduced his personal equipment at the cost of time-independent QSOing; he is time-sharing the resource with others.

To establish a gateway SO, the user could simply pick up his hand-held and tap out a few numbers on the DTMF pad to instruct the terrestrial repeater to enable gateway mode. When the gateway replied with a personal signal indicating the satellite's Demand Assignment Multiple Access (DAMA) facility had responded, indicating a vacant channel pair was available, the gateway user would then tap out the code for the other gateway he wanted to link to. The DAMA facility would then assign a channel pair to the originating gateway and the target gateway, and the link would be established for a preset time period. Users of the originating repeater would then be in contact with users of the target repeater.

The technology to achieve this type of circuit is not new. It derives straight from the pages of today's terrestrial cellular mobile telephone systems. Amateur radio implementation of a similar system could be much simpler, however, since much of the redundancy and protection used in cellular mobile radio (to assure privacy and avoid mis-connects) could be eliminated. It is obvious that the S2 sub-transponder could spur enormous achievements in emergency as well as routine communications. . .end of quote.

Next month's column will continue with a description of the other Phase 4 transponders — S3: Packet Gateway Interconnect, the S4: Broadcast Mode Gateway Transponder and the S5: The Mode S Video Sub-Transponder.

—de Graham VK5AGR
ar

THOUGHT FOR THE MONTH!

A smile — none is so rich or mighty that they can get along without it, and none is so poor that they are not made rich by it.

General AMSTAR System Description, Space Segment

JL Transponder

- High-power linear transponder
- 120-W PEP output
- Mode JL: 2 meters and 24 cm up; 70 cm down
- 500-kHz-bandwidth downlink (approx 175 kHz at 2 m; 325 kHz at 24 cm)
- Global beam coverage, all bands
- Spacecraft antenna gain:
  2 m: 2.1 dBi
  70 cm: 12.5 dBi
  24 cm: 16.0 dBi

S Transponder

- Medium-power linear transponder
- 50-W PEP output
- Mode S: 24 cm (1260 MHz) up; 13 cm (2401 MHz) down

Subtransponders:

S_1: 100-kHz passband for "normal" mode (FDMA) global communications

S_2: 100-kHz passband for 20 voice repeater gateway interconnects (TDMA)

S_3: Packet gateway interconnect; nominally 19.3 kbits/s

S_4: The S_2 transponder used in broadcast mode

S_v: Integrated Services Digital Network (ISDN) transponder; 500 kbits/s

- Global beam coverage, uplink and downlink bands
- Spacecraft antenna gain:
  24 cm: 16 dBi
  13 cm: 16 dBi

Microwave Experiment

- Possible 10-GHz stable source for link tests and equipment alignment

TABLE 1.

Preliminary User Equipment Requirements

Mode J

Receive antenna: 15.0 dBi (on-axis)
Preamp noise figure: 1.0 dB
Feed line + misc loss: 1.3 dB
System G/T: −9.8 dB/K

Transmitter power output: 10 W (avg)
Transmit antenna gain: 13.0 dBi (on-axis)
Feed line + misc loss: 1.3 dB
Transmit EIRP: 20.2 dBW (avg)
(105 W)

Mode L

Receive antenna: 15.0 dBi (on-axis)
Preamp noise figure: 1.0 dB
Feed line + misc loss: 1.3 dB
System G/T: −9.8 dB/K

Transmitter power output: 10 watts (avg)
Transmit antenna gain: 19.5 dBi (on-axis)
Feedline + misc loss: 0.3 dB
Transmit EIRP: 29.2 dBW (avg)
(832 W)

Mode S_1 (General Linear Communications Transponder)

Single dish antenna for TX/RX: 1.5 m (5 feet); dual feed with 50% efficiency.
Receive antenna gain: 28.5 dBi
LNA noise figure: 1.0 dB
Pointing loss: 1.0 dB
Feed line + misc loss: 1.1 dB
System G/T: +4.7 dB/K

Transmit antenna gain: 23.0 dBi
Transmitter power output: 10 W (avg)
Transmit misc losses: 1.3 dB
Transmit EIRP: 30.0 dBW (1000 W)

Mode S_2 (Voice Gateway Interconnect)

Same as S_1 station equipment except:
Feed line + misc receive loss: 0.6 dB
Receive noise figure: 0.7 dB
System G/T: +6.1 dB/K

Mode S_3 (Packet Gateway Interconnect: 19.2 kbits/s)

Same as S_2 station equipment

Mode S_4 (Receive Only Gateway Interconnect-Broadcast Mode)

Same as S_2 station equipment

(Mode S_v and microwave beacon user equipment continue under study at this writing)

Table 2.

Link Performance

Mode	Avg Downlink S/N	Peak Downlink S/N	$\frac{E_b}{N_0}$
J	10.5 dB	21.5 dB	12.0 dB
L	11.3 dB	22.3 dB	12.8 dB
S_1	13.4 dB	24.4 dB	14.9 dB
S_2	15.0 dB	33.0 dB[1]	16.5 dB
S_3	—	—	13.2 dB
S_4	21.4 dB	39.4 dB[1]	12.3 dB[2]
S_v	—	—	12.0 dB[3]

[1]ACSSB use assumed; subjective improvement over unprocessed SSB equal to +8dB.
[2]Result obtained if the S_4 Mode were to be used as a dedicated packet link at 32 kbits/s.
[3]At a data rate 500 kbits/s.
[4]The ratio of energy per bit to the reference noise.

Table 3.

SATELLITE ACTIVITY FOR THE MONTH OF NOVEMBER 1986

1. LAUNCHES

The following launching announcements have been received:

INTL NO —1986	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INCL deg
085A	Cosmos 1790	Nov 04	USSR	89.4	315	207	72.9
086A	Cosmos 1791	Nov 13	USSR	105.0	1026	972	83.0
087A	Cosmos 1792	Nov 13	USSR	86.9	357	181	64.9
088A	Polar Bear	Nov 14	USA	104.9	1015	960	89.6
089A	Molniya 1-69	Nov 15	USSR	12hr16m	40817	469	62.9
090A	Horizont 13	Nov 18	USSR	23hr57m	35824		1.4
091A	Cosmos 1793	Nov 20	USSR	11hr49m	39323	611	63.0
092A	Cosmos 1794	Nov 21	USSR	115.6	1498	1464	74.0
092B	Cosmos 1795	Nov 21	USSR	115.4	1480	1464	74.0
092C	Cosmos 1796	Nov 21	USSR	115.2	1475	1454	74.0
092D	Cosmos 1797	Nov 21	USSR	115.0	1470	1442	74.0
092E	Cosmos 1798	Nov 21	USSR	114.9	1470	1427	74.0
092F	Cosmos 1799	Nov 21	USSR	114.7	1470	1412	74.0
092G	Cosmos 1800	Nov 21	USSR	114.5	1470	1397	74.0
092H	Cosmos 1801	Nov 21	USSR	114.4	1468	1384	74.0
093A	Cosmos 1802	Nov 24	USSR	105.0	1038	985	83.0

2. RETURNS

During the period 39 objects decayed including the following satellites:

1986-077A	Cosmos 1784	Nov 11
1986-081A	Cosmos 1787	Nov 04
1986-084A	Cosmos 1789	Nov 14
1986-085A	Cosmos 1790	Nov 18

3. NOTES

1986-088A Polar Bear will conduct several experiments to study atmospheric effects on electro-magnetic propagation.

1986-089A Molniya 1-69 has communication equipment designed for long-distance telephone, telegraphic radio and television broadcasting.

1986-090A Horizont 13 has communications and television equipment on board.

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

of the things people not connected with ...teur or CB radio find hard to understand is ... it is possible to have real friends one has ...r met.

To amateur radio operators, of course, this ...endship is a very real and lasting thing. We get ... know someone on air, and before long are ...ring regular scheds, exchanging news, letters ...d photographs.

We know all about each other's family, home, ..., etc share in their joys and feel sadness in their ...

This has been brought home to me personally following the sudden death of our eldest son in a ...reak accident. The kindness and sympathy of so ...nany *radio* friends has been a great comfort to us. ... we can say is a simple, heartfelt *thank you.*

Our son Will, was also an amateur radio ...erator, and although he did not have much time ... devote to the hobby, he was always on hand, in ...s quiet way, to help when needed, particularly ...ith activities such as JOTA.

He was a wonderful example of the best ...spects of amateur radio — friendship and con...deration of others. Perhaps these are the things ... need to cultivate most in our hobby, and ...maybe there is a great need for them in this ...modern sophisticated world.

ALARA CONTEST RESULTS

Call Sign	Points	Comments / Certificates
...K3CYL	1100	Winner Overall and VK3 ALARA member
...3DMH	918	
...4ASK	857	VK4 ALARA member
...3DYL	751	
...2EBX	731	VK2 ALARA member
...6DE	721	VK6 ALARA member
...8FA	704	FK ALARA member
...ZL1BIZ	506	ZL ALARA member
...K4AOE	432	
...5AOV	403	VK5 ALARA member
...BRX	400	ZL non-ALARA member (YL)
...K5YL	395	
VK3CQP	303	OM Certificate
VK3RB	302	
VK7HD	277	VK7 ALARA member
...K4VR	236	
...K6YF	231	
VK3DMS	219	
VK4XX/M	183	
VK4BKM	179	
ZL1BWQ	163	
VK3CLS	159	
VK2EKY	152	
VI5ANW	152	
VE7YL	148	VE ALARA member
VK4BRZ	146	
VK3DYF	134	
VK5GZ	134	
VK8AV	133	
VK2PXS	127	VK Novice and Florence McKenzie Award
WA3HUP	126	W ALARA member
WA3CQN	126	W ALARA member
VK3XF	124	
ZL1BBN	121	
VK3LC	95	
G4EZI	56	G ALARA member
VK7RY	55	
VK2DJJ	55	
VK3AKD	50	
VK2NEV	45	
VK3YU	40	
VK2KDX	34	VK-YL non-ALARA member
VK1LF	24	

Check logs were received from VK3ARK, VK3KF, VK3KS, VK3XB, ZL1ALK, ZL2AWP, ZL2BOD, ZL2VQ.

Of the 51 logs received, 28 were from ALARA members, three from YL non-ALARA members and 20 from OM.

Congratulations to Kim VK3CYL for her magnificent achievement and to the runner-up, Jan VK3DMH. Also, to all the Certificate Winners.

Our thanks to all who supported the ALARA Contest and helped to make it a success. It is very pleasing this time to have a winner for the Florence McKenzie CW Novice YL Trophy. Special congratulations to Bobbie VK2PXS.

WEDDING

The amateur radio fraternity were well represented at the wedding of Terry Morrison VK3RB and Jan McKinnon VK3DMH, which took place at Richmond on December 20, 1986.

Also present, but not in the photograph, were Allan Clark VK3CAC, Paul McMahon VK3CGR and wife Anna.

Congratulations, Terry and Jan. We all hope you can reach an amicable agreement about use of the microphone, at least until a little harmonic appears on the scene causing too much localised QRM!

Terry VK3RB and Jan VK3DMH, on their wedding day, December 20, 1986.

SECOND ALARA GET-TOGETHER

Adelaide, September 26-27, 1987

Program: Arrive Friday, September 25 or Saturday, September 26.
Saturday September 26:
9.30 am — Meet at Walford (Anglican School for Girls).
10.30 am — Morning Tea.
12.30 pm — Lunch.
2.30-5.00 pm — Tour of Adelaide including Afternoon Tea at WIA Headquarters.
7.30 or there-abouts — Meet at the QTH of Meg VK5AOV for dinner and social evening.
Sunday September 27:

From Left: Ruth Allen, Don Allen VK3NXN, Bob Milne VK3FO, Kevin Wallis SWL, John Gurney VK3AMC, Ian Williams VK3MO, Terry Morrison VK3RB, Jan Morrison (nee McKinnon) VK3DMH, Ray Berger VK3KEL, Moira Knowles (wife of VK3NGK), Len Verneulen VK3COD.

9.30 am — Meet at Victoria Park Racecourse.
10.30 am — Cleland Conservations Park (cost $3 not included).
12.30 pm — To the QTH of Denise VK5YL, via Mount Lofty.
1.00 pm — Lunch.
End of official program.
3.00 pm — Visit to Hahndorf.

Accommodation — Granada Motor Inn, Flag Motel. Bookings may be made through local Flag Motels or by writing to Granada Motor Inn, 493 Portrush Road, Glenunga, SA. 5064. Telephone (08) 272 8211. (Mention ALARA Group Booking). $25.00 deposit required with booking. Twin Room costs $48.00 approximately.

NEW MEMBERS

Welcome to new members:
Anne VK4KZX, Debra VK6OJ, and DX new members, Betty VR6YL, Betty KA6NZK, and Sylvia G4VBT.

WEEKLY NET

Our 80 metre weekly ALARA Net is well patronised in spite of QRM, QRN, etc. Remember ladies, you don't have to be an ALARA member to come up and have a chat with us — we are a pretty friendly group.

The Net meets on Mondays, 3.580 ±QRM, 1030 UTC (1000 UTC during daylight saving).

Our warmest wishes to Ken McLachlan VK3AH. We hope you are now well on the road to recovery, Ken, following your accident.

Until next month.

—73/33, Joy VK2EBX

RADIO FAX

O Ambulance Service — Melbourne has a new mobile communications and command unit with, what is claimed to be Australia's first radio-linked facsimile machine.

Adding a new dimension to emergency communications, the donated FAX will be ideal in obtaining printed information needed for patient care following hazardous chemical accidents.

The unit is fitted with radio transceivers, microwave dishes and telephones and can be used anywhere in Victoria during a disaster.

Education Notes

Guest Writer: John Edmonds VK3AFU/ATG
RMB 9320, Moriac, Vic. 3240

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

We have accepted, usually without question, that our pet organisation, professional, academic, sporting or whatever, is in dire need of young blood, that we are losing the interest of the young, that management is old. We have it on the authority of Plato. So the WIA should *do something about it.*

The Institute, individual members, various radio clubs and DOC, have maintained a policy of helping and encouraging the less old. Their methods have generally been the traditional ones, supplemented by the serendipitous occurrence of, and encouraged influx from, CB. Should we be doing more? If so, what?

It is fashionable to criticise the traditional methods.

Because people evolve less rapidly than technology there is no particular reason why methods which have been successful previously should not be used. Unfortunately we are unlikely to be able to speed up the traditional processes.

Also, unfortunately we do not know in any detail the reasons why young people become interested enough to sit for DOC examinations. It is tempting to suggest that another survey is needed. Previous surveys do not stand up to critical analysis although they are useful indicators and could be used to design a survey which would stand statistical treatment. It would be an interesting, but protracted job. What can we do or plan using standard beliefs, myths, traditions and some ingenuity?

The first thing should be to try to get together the many ideas which float around in the amateur and educating communities. We have all heard some of these ideas. We have even seen one or two in print with at least one serious attempt to stimulate interest. So this is a plea for communication. Could we, as some of the worst communicators, make sure that our ideas go to the obvious collection centre, the WIA. Some ideas will be impractical, some will be illogical, some may be amusing, but that does not matter. Most of the bright ideas have seemed irrational to us, aged and conservative.

We cannot repeat the CB influx. We should be able to apply some of its lessons to new aspects of modern technology, presumably to computing.

What are the developing interests of the young?

We seem to have neglected the influence of the old. The common thread in the *Silent Keys* tributes in *Amateur Radio* is that the silent keys encouraged and helped others into the hobby. How many of our recent amateurs have had this sort of help? In the long run it may be more useful to encourage mature age students, or even the very mature, because there will be an inevitable flow on to the grandchildren. Even those of us who were brought up on coherers and slop jars and loop modulation are capable of encouraging enthusiasm for strange and wonderful things like packet radio, linked repeaters and HF DX.

So if you feel strongly about the need for encouragement of the young put your ideas into the word processor, or even write them down, and send them to the WIA. Some of the old people will sort them out and collate them.

The Editor of AR will be threatened with Grey Power if he doesn't publish them.

THINGS WERE EASIER THEN?!?

Recently, whilst searching through some old papers for a particular item, I came across my original AOCP examination paper, April 1935.

This may be of interest for its nostalgic value or even to question some of the comments one hears these days; "Things were much easier then!"

Maybe they were but, as those of that era well recall, getting assistance was well nigh impossible and the only way was *head down and tail up* in the *ARRL Handbook*. Morse was only learned by building a regenerative detector and just listening. (I still think that "just listening" is the best way to learn and enjoy Morse).

Subsequent commercial examinations over the years have not held any greater terrors, nor have they given any greater satisfaction, than getting that magic piece of paper in 1935.

(Incidentally, I never did find what I was looking for!).

Commonwealth of Australia
Postmaster-General's Department
Amateur Operator's Certificate of Proficiency
Victoria and Tasmania April, 1935
Time allowed — 2 hours
THEORY

1. A battery of eight cells is arranged four in series and two in parallel. Find the strength of current if each cell has an electro-motive force of 1.9 volts and internal resistance .3 ohm.
2. (a) Why is it necessary to provide greater smoothing in the power supply to a radio-telephone transmitter than to an oscillator-amplifier CW transmitter? Discuss any methods employed to obtain satisfactory smoothing.
   (b) Is any advantage obtained from the reduction of rectifier valve peak current?
3. (a) For plate efficiency in a power amplifier, what grid bias conditions are required?
   (b) Compare the advantages or otherwise of grid-leak and battery bias.
4. Describe, with the aid of diagrams, the considerations governing the construction and erection of a stable aerial system for operation on the 56 mc band. Indicate any directive properties possessed by the system you describe.
5. (a) With a three-stage transmitter, do you consider any difficulty would be experienced in connection with key-clicks and the emission of a back-wave when keying in the middle stage? Give reasons for your answer.
   (b) Compare two practical methods of keying.
6. (a) In a master oscillator circuit, what are the effects of regenerative reaction between the main and master circuits? Would these effects be experienced similarly in a self-oscillatory circuit?
   (b) What steps are usually adopted to prevent the above condition?
7. (a) Discuss the theory of electron flow in relation to conduction and convention currents.
   (b) Compare the flow of Alternating Current with that of Direct Current.

REGULATIONS

1. What procedure should be observed by a station when sending signals for the purpose of tests, adjustments or experiments?
2. Translate the following abbreviations:
   QRW; QSE?; QSV?; QSZ; QTU?; W; AB; CS; NW; WB.
3. Indicate in Morse characters the signal used by a British warship when calling a coast station, and state its significance.

—Contributed by Ray Kilby VK7RK

Electro-Magnetic Compatibility Report

SHIELDING: the lost art

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

Old timers will remember the time when we had to build our transmitters the home-brew way. An operator learned quickly when he burned his whiskers at the microphone or his fingertips at the Morse key, that the cabinet had to be a shield enclosing all RF power, not just a nicely painted dust-cover. (Figure 1 shows the right and wrong way of installing pre- amplifier pi-filter components). If they become part of an RF current path the cabinet and chassis no longer act as a shield. The cabinet and attached leads (key, phone, coaxial antenna cable, etc), become RF radiators in spite of only nominal shielding. The same applies in reverse for electronic appliances like television, radio and Hi Fi sets, microprocessors in computers, video recorders and cars, to name but a few.

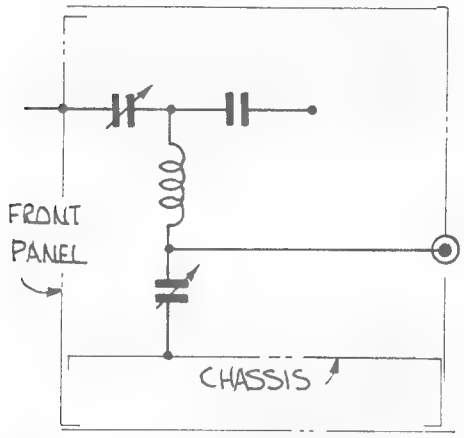

Figure 1a — The Wrong Way of installing the pi-filter capacitors of an amplifier.

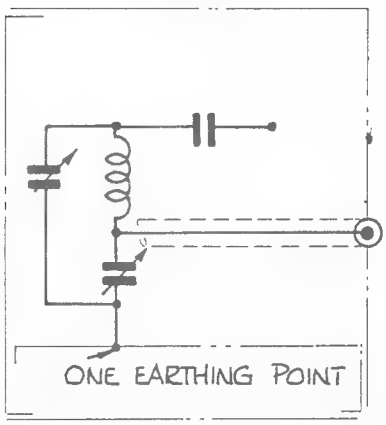

Figure 1b — The Right Way of installing the pi-filter capacitors of an amplifier.

The chassis and front panel must not be a part of the inductance. High RF current goes through the chassis and front panel. Both capacitors must come to the one earthing point on the chassis, and here too the current emitting electrode of the amplifier should be earthed directly, or via a bypass capacitor. The metal shafts of the variable capacitors must go through metal bushes which provide a good contact, otherwise RF can leak to the tuning knob and its metal parts.

The now, often, missing shielding allows the attached cables (shielded or not), the printed-circuit boards, internal wiring and components, to pick-up unwanted RF energy from an ever-increasing variety of sources which result from the development of our electronic age.

Table 1, from the excellent book, *Television Interference* by the Remington Rand Laboratory USA, shows clearly what happens and how to prevent RF leakage. (The writer received the above book in 1956, from Phil Rand W1BDM, after many QSOs discussing television interference). It is only necessary to look at a well-designed signal generator, which is RF-proof to 0.1 uV, to understand what shielding is all about.

QST, reported the case of the RFI experienced by an imported car when the owner installed his mobile radio equipment. The sales representative recommended the amateur "shield" his transmitter's antenna! This is another case of stopping RFI by closing-down the amateur activity. (Please read about the situation in the UK, AR January 1987, p61-62).

We have recently learned of two locally assembled cars which dislike two metre rigs or

Table VI—Filter Circuit Arrangements

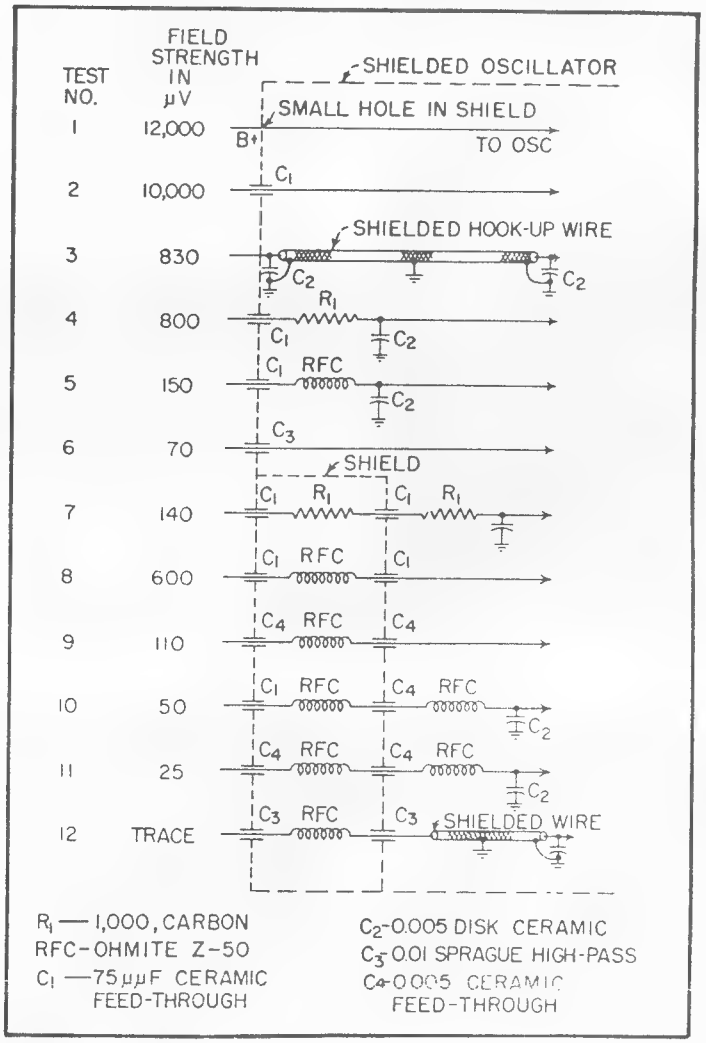

Table 1 — Filter Circuit Arrangements. There is no RF outside an air-tight metal box, enclosing an oscillator, which has only one earthing point inside the shielding box! Magnetic metal would also shield the magnetic RF field component!

cause interference to two metre transceivers (micro-processor shielding and filtering missing).

The West-German electronics magazine *Funkschau* published several special booklets on EMC problems and cures more than 10 years ago. Several dealt with RFI and motor cars. One could also purchase a cassette tape which played RFI sounds as received by mobile receivers. After one minute of characteristic RFI a voice explained the kind of interference, the location of the source and how to deal with the problem in the case of more popular models.

Special firms that deal with car RFI investigate what has to be done as soon as a new model is released on the market. They provide information, filters, coaxial capacitors, shielded cables, resistors and ferrite chokes so that car workshops do not have to repeat the exercise. By leaving the job to a specialist in the particular field saves time and money.

So-called modern equipment assembly methods may help the insertion of a large number of components automatically in printed circuit boards, but this may well be a backward step of 50 years as far as RFI is concerned.

The FT-901DM transceiver is an example of how it should be done. RF or pulses carrying stages are in individual shielded metal boxes plugged into a common metal chassis. Only the driver tuned circuit is not completely shielded. With the help of extender boards one can easily reach most components. Testing the shielding shows that RF escaping from RG8U coaxial cable is many times stronger than any transceiver leakage. The transceiver shielding exceeds about 90 dBm.

This also means that an attached low-pass filter to the antenna terminal will be fully effective.

Its shielding will not be bridged by the RF-cold chassis and dust cover.

The following case demonstrates how wrong the "modern way" can be:

A 100 watt, 435 MHz transistorised final amplifier had all components, including the GaAsFET receiver preamplifier, assembled on one printed board. The strip line inductors were located in the middle. The board was screwed at several places to the heat sink and the bottom was closed by a perforated plate, held by one screw to the sink. (Didn't we learn 50 years ago that shielding can only be effective if the chassis cabinet panels are held by screws every two inches (5 cm)!). It seems our young engineers, who are computer experts, have re-invented this technique now. To make matters worse, the ohm-meter showed that the heat sink and the bottom plate are both anodised with a well insulated skin. Anodising stops discolouration by fingerprints but prevents closing gaps of RF shielding metal plates. As a result, the whole PC board was carrying a high RF potential.

An absorption-type frequency meter (tuned circuit, Ge-diode, 50 uA meter, no amplifier) standing about 30 cm (one foot) away from the rig, showed full scale deflection from stray radiation. RF leaked from the front switches, power meter and especially from the 13.6 volt DC leads which go to the power supply. In this case, harmonic output cannot be suppressed by a shielded filter because the chassis was not at RF-zero-potential and the coaxial feeder radiated strongly, as well.

Bypass capacitors at the 13.6 volt input terminal also had no effect, as was to be expected. A shield across the input and output side of the preamplifier was naturally also ineffective to reduce the tendency to self-oscillation of the stage. The pi-filter type of match-box (antenna coupler) showed power and SWR variation when the 13.6 volt wires were held in the hand. In such a case, when no earthing point can be found, we can only use ferrite rings as RF chokes to reduce RF leakage and unwanted radiation.

By placing the 13.6 volt wires through a large ferrite ring, making a three- turn coil, reduced the leakage substantially to about a tenth of the original amount and the output power also increased by 10-15 watts. Strip line inductors of UHF tuned circuits are easy to repeat and manufacture, but shielding them is a different story when the whole rig is on one printed circuit board.

In the case of television sets, one can do the following if the set has no chassis to speak of and therefore no effective earthing point:

Use a coaxial 2x1 turn transformer close to the television antenna terminal to stop unwanted RF entering the television set via the coaxial feeder braid. Earth the feeder close to the coaxial transformer input end to the nearest water pipe. Wind the mains cable around a ferrite rod close to the set or use a ferrite ring and 10 turns of the mains cable. If nothing helps, a high-pass filter will be useless too, one can use the method recommended by the FTZ (the DOC in Germany). This is to line the inside wall of the television cabinet with metal foil and wire mesh, where ventilation is required. Bond this shield to several of the television's earthing points with two centimetre wide short metal strips. Now a mains line filter and antenna high-pass filter have a chance to help if their shields are re-bonded to the metal enclosure.

Filters should be shielded and sections separated by soldered PC board pieces. This will avoid bypassing the tuned circuits the filter is made of. When holding the television antenna plug near the television set's antenna terminal at a distance of a few centimetres, it can be seen that some television signal is being picked-up already. This is why filter sections must also be separated by shielding walls. The filter case must have no cracks or gaps and should be soldered to ensure it is RF-proof. This becomes even more necessary as more television stations operate on UHF frequencies. This is why signal generators and EMC-testing equipment use "metal RF weather-stripping" between shielding boxes and their lids, which provide reliable contact between the lid and case (no anodising here!).

Figure 4 and 5 show that feeder separating transformers are necessary if unwanted RF reaches the television set via the braid of the coaxial cable. The braid is usually connected to the set's chassis via 470 pF safety capacitors and is not directly earthed. One can us a small twin-hole ferrite core and wind two windings of two to three turns of 0.3 mm diameter insulated wire through the two holes. This transformer does not attenuate signals below 70 MHz. The insertion loss is about 2-3 dB over a wide frequency range. The coil to coil capacitance is about 4 pF. If the balun-type television ferrite core cannot be obtained, one can make a 2x1 turn coaxial transformer. Two lengths of RG59U, about 30 cm long, are connected, as shown, per turn, and both rings of cable are placed on top of each other (not as shown as they are shown like this for clarity) and held together with tape. This transformer attenuates the lower frequencies of less than 40 MHz by about 10-18 dB. Between 100 and 250 MHz, the attenuation is 3-5 dB. The cable losses are felt at higher frequencies (Channel 28). The feedline should be earthed near the input end of the filter.

Information about RF Filters may be found in most amateur radio books and in AR, July 1982, p15-17.

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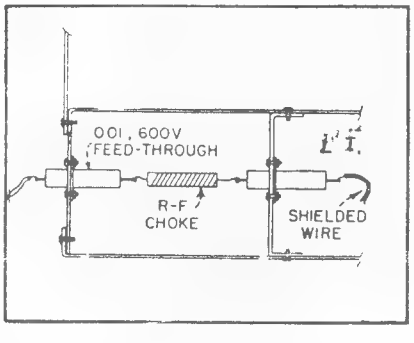

Figure 3 — The correct way of separating RF from supply power sources.

Figure 4 — Coaxial braid separating transformer.
The two coaxial cable loops are to be placed on top of one another and held together by insulating tape. The left cable goes to the television antenna and the braid is earthed near the set on this side. The right cable goes to the television antenna terminal.

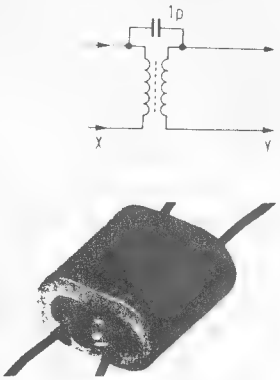

Figure 5 — The ferrite double-hole core separating transformer is connected between the television antenna cable and the television antenna terminal. The 1 pF capacitor reduces losses at 400 MHz and higher television channels.

QSP

INFORMATION FOR ALL MODEM USERS

USING A MODEM not authorised by Telecom could cause electric shocks — to both yourself and Telecom workers on the lines.

It could damage the telephone network and interfere with other people's conversations.

So look for the Telecom authorisation number on any modem you buy.

For example: C86/37/2134
— C shows authorisation by Telecom.
— 86 is the year of issue.
— 37 is the type of modem.
— 2134 is the identification number.

Using an authorised modem could lead to a fine, possible disconnection of your service and you may be liable for damages.

If you are unsure whether your modem is authorised, first contact your supplier. If further information is needed, phone Telecom on:

NSW	(02) 265 1804	SA	(08) 217 9292
VIC	(03) 606 5770	TAS	(002) 20 8800
QLD	(07) 835 8249	ACT	(062) 45 5555
WA	(09) 420 7477	NT	(089) 89 3233

—From *Telecom Topics* 4300/4151

Radio Amateur Old Timers Club

Kevin Duff VK3CV
PUBLICITY OFFICER
Radio Amateur Old Timers Club

A group of Old Timers who attended the 1976 Dinner of the RAOTC at the Sciences Club. From left (back): Bob Cunningham VK3ML, Founder of RAOTC; Gil Miles VK2KI (SK), early experimenter with facsimile and television; Bill Butement VK3AD, associated with the design of military and wartime communications equipment in the UK; Alex Stewart VK3BMS, well-known in AWA engineering circles.
Front: Will Henry, OM of first Australian YL; Austine Henry VK3YL, Australia's first lady amateur; "Snow" Campbell VK3MR, one of the oldest of the Old Timers and still active; Vaughan Marshall VK3UK, rose to Group-Captain in the RAAF during World War II after being an original leading member of the WIA Wireless Reserve.

The RAOTC monthly news bulletin and call-back takes place on the first Monday of each month and, for the Eastern States, commences at 2300 UTC. Three frequencies are used, 3.624 MHz, 7.060 MHz and 145.700 MHz FM, for Melbourne members. The call-back takes place on all of these frequencies.

At 0100 UTC, the long-haul net from VK6 commences on 14.150 MHz.

All members are welcome on both of these nets.

The January 5, Eastern States News Bulletin and Call-Back was well attended with a total of 60 station in the call-back. Despite poor 80 metres conditions on a hot summer morning, there were 15 call-backs on this frequency, 42 on 40 metres and 12 on two metres. A feature of the news bulletin was a tape from Alf Chandler VK3LC, who was the Intruder Watch Co-ordinator for a very long time. Alf spoke for 15 minutes about his life with amateur radio and this was enjoyed by everyone.

We have had a number of these tapes included in our news bulletins but we do need more of them. I am sure that there are many of our members who could recall memories of earlier days. The subjects need not be concerned with radio and should be no longer than 15 minutes. They will need to be recorded on a normal cassette tape and forwarded to "Mac" McConnell, 23 Stewart Street, Ormond, Vic. 3204. So how about it members? We look forward to hearing from you.

Members of the RAOTC are reminded that the Victorian Annual General Meeting and Dinner is to be held on Thursday, March 5, at the usual venue, the City and Overseas Club, 291 Dandenong Road, Windsor. If you have not already accepted, you can telephone your booking to Harvey Utber VK3AHV on (03) 534 4616. Cost of the dinner is $20 and members pay for their own drink. The dinner fee can be paid at the venue.

Members are cordially invited to bring a friend who may be interested in our Club. The evening begins about 6.30 pm, dinner at 7.00 pm. See you there!

HELLO 'OLE TIMER

When you lose the thrill of a QSO
With a W-one or two,
When the fact that you're heard in some far distant land
Just don't mean a thing to you.

When sending a card is a burdensome task
And a "listeners'" card is taboo.
It's time you pulled switches and closed up you shack
For there's nothing in this game for you.

When you snub a beginner, when a "chirp" is a crime,
And a "QRS" plea you abhor,
You better get out of Ham Radio, friend,
For there's no fun for you any more.

I just love to be told, "You're my first VE2,"
If he only lives over the line.
The pleasure of working a Chirpy DC
Is a thrill, boy, to me anytime.

I like to "pipe down," send slow to a kid.
Sure — tell him his keying is fine.
And when he comes out with that "Pse QSL,"
Believe me, the pleasure's all mine.

If you would enjoy this old Radio Game
Just pause and hark back o'er the years
When you hooked a "seven" you thought you'd done fine,
And to lose him just almost brought tears.

You've got to think back to your lid days again
And remember that this is quite true,
You must do unto others in this Amateur World
As you'd have them do unto you.

—From *QST*, January 1936, by D R Sheehan VE2DG

EXTRACT ON AMALGAMATED WIRELESS (AUSTRALASIA) LIMITED

Amalgamated Wireless (Aust) Ltd

This reference is from particulars of the leading Companies of the world engaged in the commercial development of Wireless Telegraphy listed on page 687 of the 1913 issue of *The Year Book of Wireless Telegraphy and Telephony.*

Incorporated — July 11, 1913, in the State of New South Wales.

Head Office — Culwulla Chambers, Castlereagh Street, Sydney.

New Zealand Office — Australasian Chambers, Wellington.

Directors — Hugh Robert Denison, Chairman and Managing Director; John Macallum Jolly, Charles P Bartholomew, Ernest T Fisk, Technical Director; John H Forrest.

Secretary — John H Forrest.

Capital — 140 000 pounds in 140 000 shares of one pound each. Issued 140 000 shares of one pound each, fully paid up. The financial year of the Company ends at November 30.

The Company owns a perpetual license to use and exploit the Marconi & Telefunken patents in the Commonwealth of Australia and the Dominion of New Zealand and in that part of the Pacific and Indian Oceans bounded by the 20 degrees norht and 60 degrees south latitude and the 110 degrees west and 110 degrees east longitude.

RAOTC QSO PARTIES FOR 1987

Three parties will again be held this year — on the second Monday in March and the first and second Mondays of August.

March 9 — 14 MHz: 0200 to 0500 UTC. CW 14.050 MHz, SSB 14.150 MHz.
August 3 — 7 MHz: 0800 to 1100 UTC. CW 7.035 MHz, SSB 7.100 MHz.
August 10 — 3.5 MHz: 0800 to 1100 UTC. CW 3.520 MHz, SSB 3.650 MHz.

Contest Exchange: Club number, date of first licence, name, age; eg A256 1951 Bill 56.
Scoring: Five points per completed contact on CW or SSB, but not both.
Multiplier: The total of VK, ZL and overseas call areas contacted.
Final Score: Contact points times multiplier.
Entries: Claimed scores showing mode (CW, SSB or CW/SSB), number of QSOs, and multiplier areas to: John Tutton VK3ZC, 11 Cooloongatta Road, Camberwell, Vic. 3124 as soon as possible after the first and third parties.

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COMPUTER DISCOUNTS

O Strong competition in the personal computer industry is giving Australian consumers their best ever opportunity to buy computer hardware at discount prices.

But industry sources warn while the price may seem right, many dealer outlets and backyarders cannot guarantee adequate after sales service.

They estimate that at the moment PCs are probably underpriced by about 15- 20 percent, due to discounting.

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED RECENTLY

HAVKCA
120 S A Fedorovich UB5-066-286
121 Igor I Slakva UB5-073-3135
122 Iskrich Aleksandr UB5-078-870
123 Romaniy Viktor UB5-060-896
124 Rukshenas Vladas UP2-038-1623

WAVKCA
1508 Anton Iriawan YB5QZ
1509 Ryoji Kobayashi JA8LN
1510 Oleg A Safronov UA0FBO
1511 Valdas J Zalnerauskas UP2NV
1512 Vladimir Mazanov UA4CGP
1513 Valery A Makarov UA0ZC
1514 Furduj Anatoly UT5RH
1515 Pavlovo-Pusad Club Station UZ3DXW
1516 Laimonis Stepans UQ2PQ
1517 Gorobec Boris Georg UD6DC
1518 A P Nazarow UA3GBI
1519 Ken Keenan K4ADN

DXCC Phone
351 Jim Baxter VK3DBQ

DXCC CW
128 Fred Beusch VK2BAC

ISLAMIC SUMMIT CONFERENCE AWARD

This award, sponsored by the Kuwait ARS, arrived too late for prior notice in AR.

However, if you worked the required stations during the Conference, January 26-29, the award may be claimed by sending a certified log extract, together with five IRCs, to the Awards Manager, PO Box 5240, Safat 13053, Kuwait.

Requirement: Work two different Kuwait stations and one station in any of the participating Muslim countries, any band, any mode, between 1200 UTC, January 25 and 2359 UTC, January 30, 1987. Applications must be received no later than March 30, 1987.

RUMANIAN AWARD

Any band or mixed.
Any mode or mixed.

Applications require a GCR and seven IRCs sent to Rumanian Radioamateur Federation, PO Box, R-76.100 Bucuresti 05-50, Rumania.

Applicants require 30 different YO counties, plus Bucarest. All YO districts (YO2 to YO9) must also be represented.

Counties are:

AB	Alba	YO5	IL	Ialomita	YO9
AR	Arad	YO2	IS	Iasi	YO8
AG	Arges	YO7	IF	Ilfov	YO9
BC	Bacau	YO8	MM	Maramures	YO5
BH	Bihor	YO5	MH	Mehedinti	YO5
BN	Bistrita- Nasaud	YO5	MS	Mures	YO6
BT	Botosani	YO8	NT	Neamt	YO8
BV	Brasov	YO6	OT	Olt	YO7
BR	Brails	YO4	PH	Prahova	YO9
BZ	Buzau	YO9	SJ	Salaj	YO5
CS	Caras- Severin	YO2	SB	Sibiu	YO6
CJ	Cluj	YO5	SV	Suceava	YO8
CT	Constanta	YO4	TR	Teleorman	YO9
CV	Covasna	YO6	TM	Timis	YO2
DB	Dimbovita	YO9	TL	Tulcea	?
DJ	Dolj	YO7	VS	Vaslui	?
GL	Gelati	YO4	VL	Vilcea	YO7
GJ	Gorj	YO7	SM	Satu Mare	YO5
HR	Harchita	YO6	VN	Vrancea	YO4
HD	Hunedoapa	YO2		Bucuresti	YO3

THE CORNISH AWARD

This award, in the form of a certificate, is issued by the Cornish Radio Amateur Club, for working Cornish stations, whether resident or visiting the county (as /A, /P, or /M) at the date of the QSO. It is issued in three classes, in three groups. Any or all amateur bands may be used, and while there is no time limit, it is expected that contacts are made after January 1, 1946.

There is one point per QSO and Certificates are issued for:

NON-EUROPE
— Amateur bands 1.8 MHz to 146 MHz.
Class 1 — 15 points. Class 2 — 15 points. Class 3 — 10 points.
— Amateur Bands 432 MHz and Higher.
Class 1 — 9 points. Class 2 — 6 points. Class 3 — 3 points.
—RTTY.
Class 1 — 20 points. Class 2 — 15 points. Class 3 — 10 points.

All contacts must be made from the same call sign but can be /A, /P or /M. Claims are welcomed for multiple certificates; ie single band, single mode, all /M, etc, but claims can be mixed. Only one point can be claimed for contacts made through a repeater on VHF or UHF.

Award fees are — 50 pence, $US1, or five IRCs.

The claim should be certified by an officer of a radio club or by two licensed amateurs, that the log book has been inspected and agrees with the contact claimed. The certificate is free to blind or handicapped operators. There is a similar Certificate for shortwave listeners, but SWL cards or reports do not count for a "Stations Worked" claim. Applicants should check during a QSO that the station is located in the county of Cornwall at the time of the contact.

Claims and accompanying Certificate with the appropriate fee should be sent to: J E Bowden G2AYQ, 22 Whites Close, Polbreen, St Agnes, Cornwall, TR5 0TU.

—Thanks to Joy VK2EBX, ALARA Publicity Officer

CITY OF WAGGA WAGGA AWARD

This certificate will be presented by the *Wagga Amateur Radio Club* (WARC) and is open to all amateurs and shortwave listeners world-wide, on 80 metres.

As late 1986 to late 1987, is the 40th Anniversary of Wagga Wagga becoming a city, the award is appropriately called *The City of Wagga Wagga Award.*

Wagga Wagga is situated approximately half-way between Sydney and Melbourne by the banks of the Murrumbidgee River on the Sturt Highway in the Riverina Region of New South Wales. It was discovered in December 1829, by Captain Charles Sturt. Wagga is an aboriginal term for crow, thus Wagga Wagga is the plural for many crows.

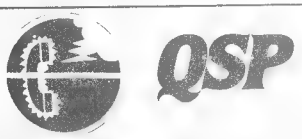
The city is 185 metres above sea level and is rural in its setting.

To become eligible for the award, each participating station will have made contact with club station VK2WG (two-points) and with other club member stations (one-point), making a total of 10 points. A station previously contacted can be worked again after seven days for an extra point. Shortwave listeners and amateur stations simply need to prepare a log extract of the contacts made showing date, time, station and signal report.

Applications to: Awards Manager WARC, Barry Gilmour VK2MUZ, 58 Tobruk Street, Wagga Wagga, NSW. 2650.

Award Meeting Nets are held on Tuesday evenings at 1030 UTC on 80 metres, 3.605 ± QRM.

Conditions for awards:
Two points for contact with VK2WG.
One point for contact with club members.
Seven days between contacts with each station to gain points for continuation of award.
Cost of the award is $3 and 10 points are required.
VK2WG can only be worked once. Log must be sent to verify contacts.



THUNDERSTORM WARNING

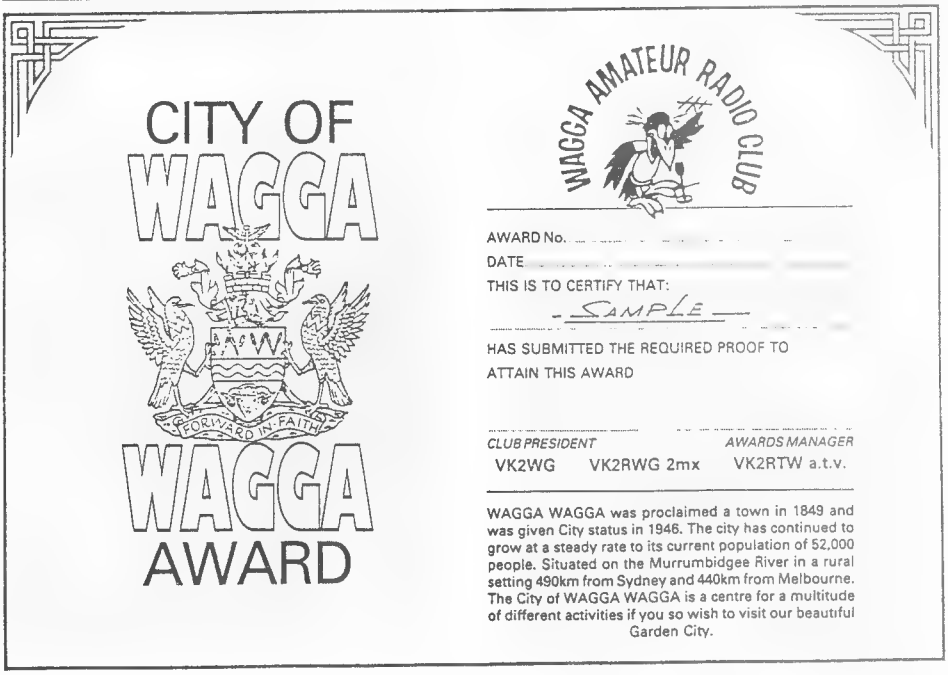
DURING A THUNDERSTORM, the telephone, in common with electrical appliances, can be a source of electric shock. The likelihood of this happening is remote, however it is possible. During a thunderstorm keep these simple precautions in mind.

- Don't use the telephone unless the call is urgent and keep the call as brief as possible.

If you must use your telephone

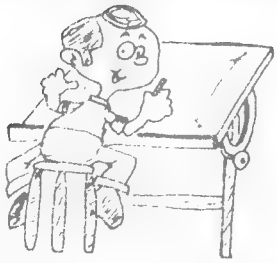
- Keep clear of electrical appliances and metal fixtures such as stoves, air-conditioning, refrigerators, sinks or window frames.
- Avoid standing in bare feet on uncovered concrete floors, or touching brick or concrete walls.

—From *Telecom Topics* 4300/4151


CITY OF
WAGGA
FORWARD IN FAITH
WAGGA
AWARD
WAGGA AMATEUR RADIO CLUB
AWARD No.
DATE
THIS IS TO CERTIFY THAT:
- SAMPLE —
HAS SUBMITTED THE REQUIRED PROOF TO
ATTAIN THIS AWARD
CLUB PRESIDENT
VK2WG
VK2RWG 2mx
AWARDS MANAGER
VK2RTW a.t.v.
WAGGA WAGGA was proclaimed a town in 1849 and was given City status in 1946. The city has continued to grow at a steady rate to its current population of 52,000 people. Situated on the Murrumbidgee River in a rural setting 490km from Sydney and 440km from Melbourne. The City of WAGGA WAGGA is a centre for a multitude of different activities if you so wish to visit our beautiful Garden City.

CLUB PORTRAIT

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131



EASTERN & MOUNTAIN DISTRICT RADIO CLUB

The Eastern and Mountain District Radio Club, centred in Melbourne's eastern suburbs, is one of Australia's greatest radio clubs.

The *Hillbillies* as it is affectionately known, is now in its 21st year — the inaugural meeting was held in March 1967.

The Club was founded by a group of limited licensees who had been involved in emergency communications. Through their amateur experience they were convinced VHF could be used in the heavily timbered and bushfire-prone Dandenong Ranges on Melbourne's eastern fringe.

In 1962, the group provided two metre AM communications for the Country Fire Authority (CFA) during a bushfire. The CFA has earlier considered that VHF would not get through the hilly terrain and had persevered with its noisy HF system.

An observer of those times says it was the so-called "Z-call rebels" who convinced the CFA on the merits of VHF — the CFA later switched to 163 MHz, which it now uses throughout the State.

The Z-call rebels were John Beckett VK3ZCB (now VK3FE/VK7FI), John Wilson VK3ZOQ (now VK3LM) and Jack Gutcher VK3ZPG (later VK3APU, now Silent Key). Working with others on a roster system, they assisted the Civil Defence (now SES), the CFA and police with emergency communications during the 1960s.

A WICEN-type centre was set-up at John Beckett's Olinda QTH, using repeaters and other talk-through devices which were advanced for their time. There were also direct telephone lines to police D24 and Civil Defense headquarters.

It wasn't until 1966 that someone suggested forming a radio club and the Z- call rebels and friends decided to personally approach every radio amateur in the Call Book in the eastern suburbs, and duly all amateurs within a designated radius received a letter of invitation to join the Club.

Ken McLachlan VK3AH (then VK3ZDK), well remembers the meetings held in the kitchen of his Mooroolbark home attempting the mammoth task of formulating the Club.

The response from the letters, on-air and personal approaches throughout the district resulted in an inaugural meeting at the Mooroolbark Technical School, in March 1967, attracting 60 radio enthusiasts. (Using a school as a meeting place of this nature was not as commonplace in those days as it is now, but John Beckett, a teacher at Mooroolbark Tech, convinced the Education Department of the worthiness of its usage and the EMDRC were granted access for 50 cents a meeting). The EMDRC's future was assured and, under a hard- working leadership, it became an active club.

In the late 1960s, the Club tapped sources of cheap solid state components (there were no chain stores for electronic hobbyists in those days). One company, in particular, Fairchild made many components which were not readily available, accessible to club members.

As the years passed, some Club projects were evolved to encourage interest and participation. One was a Barlow Wadley Loop receiver — rather advanced for its time — and a logic probe, however neither project could be described as being highly successful.

Much later, another ambitious project — a home-brew computer — was also not the success it was hoped to be but those participating certainly built on their knowledge about the technology.

In a bid to inject some kit-building activity into the Club thought was given, in 1986, to suitable projects — the first a computerised SWR meter — other kits are planned.

Finding the necessary bits and pieces for home-brewing can be difficult and for that reason the Club has a components group which attempts to source parts locally or overseas.

At the time of the Annual Meeting, March 26, 1971, the Club had 234 members. Fees were $3 for adults (of which $1 was set aside for a proposed building fund) and $1 for pensioners and juniors. To promote the interest of juniors, "Teach-Ins" were held once a month.

During 1971, the Club was honoured when the Right Honourable Lord Casey, accepted an invitation to become Patron of the Club.

The EMDRC had an excellent relationship with the local councils of both Croydon and Lilydale. It participated in the Proclamation Ceremony when the Shire of Croydon was declared a City and provided a radio communications display for the Shire of Lillydale when it celebrated 100 years of local government (1872-1972).

When Croydon became a city, EMDRC members installed their equipment in the Croydon Youth Club, a few hundred metres from where the Governor of Victoria declared the shire a city, and were able to broadcast the news world-wide. Congratulations were received from every state in the US and from some European countries. The mayor of Croydon, in the UK, sent his congratulations, which were taped and played during the ceremony at the council chambers.

World-wide congratulations were also received for the Lillydale Centenary and visitors to the EMDRC demonstration were entertained by a slow-scan television display and were able to inspect a new communications vehicle, the first of its kind designed for use in bushfire or disaster, where conventional means of communication were out of action. News of the Centenary was also relayed on two metres from an aeroplane above Lilydale.

So warm was EMDRC's relationship with both councils, it was hoped to build its own club rooms on a 99-year lease of council land. (In 1969, the Club had a building fund with $10 000 — but the goal of having its own rooms was not achieved).

A club milestone was its move to Nunawading. This was carefully engineered by setting up an EMDRC Nunawading branch, which took out its own call sign, VK3BNW. (The Club already had the call sign VK3ER).

The plush Willis Room at the Nunawading Civic Centre was a welcome change to the cramped school desks at Mooroolbark — the "branch" grew and the Club moved to Nunawading.

For seven years EMDRC ran carefully structured classes targetted at the examination paper questions. Their success saw an influx of new radio amateurs — many who today display a loyalty and sense of obligation to EMDRC for assisting them to get their ticket.

Past success for EMDRC can be attributed to the calibre of committee members such as John Beckett, John Wilson, Jack Gutcher, Ken Nesbit, Ken McLachlan, Tony King, Keith Nicholls, Reg Durrant, Neville Sleep, Max Dawkins, Bob Duckworth, Errol Stodden, John Hutchison — just to name a few.

Bob VK3AIC — dubbed Super Duck — was (and still is) a ball of fire and probably the club's best meeting chairman. Described by a close associate as "the supreme optimist" Bob has the philosophy that you organise something, if only five turned and all enjoy themselves — then the event is a success.

EMDRC has been considered by some to be invincible. "You can't do much to harm the EMDRC — it will go from strength to strength" was a phrase which summed up a belief held for many years. It was the Club's leaders projecting a display of strength and progress.

But in recent years, that image has been tarnished by some in-fighting and squabbles.

Official membership peaked at 470 in 1982-83, but has since declined to about half. This is due, in

After the Croydon Proclamation Ceremony, Sir Rohan Delacombe and Lady Delacombe, were most interested in the EMDRC display. From left (standing): Sir Rohan Delacombe, Mayor Frank Kennedy (partially hidden), Lady Delacombe, Lady Mayoress Carmel Kennedy, Ken Palliser, Ken McLachlan VK3AH (EMDRC President 1971-72), Keith Nicholls ex-VK3ANI (EMDRC Treasurer 1971-72), Bruce Pimblett VK3PIM. (Committee Member 1971) and his son. Seated: Bett McLachlan (Logkeeper) and Jack Gutcher VK3APU (now SK).
—Photograph courtesy Bob Gatherum

City of Croydon

The Council meets on the 1st and 3rd Monday in each month. All communications to be addressed to: The Town Clerk.

City Offices: Foch Avenue, Croydon, Vic. 3136
P.O. Box 206, Phone 723-0371

Mr. K. J. McLachlan,
The President,
Eastern & Mountain District Radio Club,
5 Masefield Avenue,
MOOROOLBARK. Vic. 3138

Dear Mr. McLachlan,

We have pleasure, on behalf of the Mayor, Councillors and Citizens of the City of Croydon, in expressing our deep appreciation of the part you and your Club members played in the Proclamation Ceremony on Saturday, 22nd May, 1971. The technical ability and enthusiasm displayed was of great help in both the Ceremony and the Special Meeting of Council.

Your Radio contact throughout Australia and the world would be unique on such an occasion, and gained this municipality very happy publicity.

We extend our thanks to all who so readily identified themselves with this historic and forward move in the progress of the City. We are very grateful for your assistance.

The Common Seal of the Mayor, Councillors and Citizens of the City of Croydon was hereto affixed this 7th day of June, 1971.

..... Mayor

..... Councillor

..... Town Clerk

VK3ER

SHIRE OF LILLYDALE
1872-1972

EASTERN AND MOUNTAIN DISTRICT RADIO CLUB

PATRON THE RIGHT HONOURABLE LORD CASEY, K.G., P.C., G.C.M., C.H., D.S.O., M.C. K.St.J.

part, to a downturn being felt generally by the hobby, and the disenchanted dropping out.

Club highlights include:

- Helping test some of the earlier OSCAR satellite packages.
- The patronage of the Right Honourable Lord Casey, statesman, politician, humanitarian, and Governor General of Australia from 1965-69.
- Leading the way be donating $1000 for the WIA WARC 79 delegation.
- Sponsoring the immigration of Mirak Rozbicki (now VK3DXI) in 1982. Mirak was a Polish national living in a refugee camp in Austria.
- Commissioning RTTY repeater, VK3RTY, in 1982.
- Commissioning voice repeater, VK3REC, in 1983.
- Communications Expo 83 held as part of World Communications Year in 1983.

A weekly teletype broadcast with call sign VK3TTY has been run under the auspices of the EMDRC for many years.

In recent years popular EMDRC calendar events are its white elephant sales held at Mitcham, and the Christmas barbeque in the Wesburn RSL Club grounds.

The Hillbillies club has made a worthy contribution to the hobby of amateur radio — congratulations on the last 20 years.

The EMDRC's postal address is PO Box 87, Mitcham, Vic. 3132.

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WALKABOUT PHONES

THE ERA OF HAND-HELD telephones has begun in Australia with Telecom's new Cellular Mobile Telephone System called *Mobilenet*. The service is available in Sydney, and by the end of this year in Melbourne, Brisbane, Adelaide and Hobart.

Telecom expects within the next eight years there will be at least 150 000 mobile phone users throughout Australia.

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Amateur Radio will soon be introducing a new advertising feature for those business people who have a message they want to publicise, but do not want to place a large advertisement.

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Club Corner

AUSTRALIAN AMATEUR PACKET RADIO ASSOCIATION

The Association is currently supplying printed circuit boards for the TAPR designed TNC2 and the C64 software package.

There have been 100 of the C64 packages distributed and development is still continuing. The latest version is an EPROM cartridge which enables amateurs without disc drives on their Commodore 64s to enter packet radio with a minimum outlay. The cartridge version supports all the facilities of the disc version, including disc operations.

Also under development is a software package version of the W0RLI Bulletin Board for the C64. This is a development of the C64 package and is intended to be an economical way for small groups of amateurs to be able to set up a W0RLI compatible system for a reasonable price. It will require discs, of course, to store messages and files for down-loading. The system has reached the stage of testing the message forwarding facility. For those not familiar with the W0RLI BBSs, they are an automatic message forwarding system that enable the user to place a message on his local bulletin board with an indication that it be forwarded to another amateur on another BBS in another city or town. For example, in Sydney a message can be placed on VK2XY's BBS and, if it is addressed to a VK4 that uses the bulletin board VK4BBS, in Brisbane, it will be automatically forwarded to the VK2AHX bulletin board, Gosford, and then onto the VK4BBS board, via 20 metres. All this is done automatically at pre- arranged times each day. Messages have been forwarded to other countries by this method.

When it is completed, the Association will place information in AR and the newsletter, *Digipeat*.

The Association's membership reached 200 at Christmas 1986, and another successful year was completed. A number of projects are in progress and it is hoped that they will be completed this year.

For readers interested in packet radio, the association sells the following items which include postage:

Commodore 64 package of a blank modem PCB, program on disc and manual for $50.

Blank PCB, manual and cartridge for the C64, $75.

For the TNC2, the blank PCB, manual and EPROMs, $150.

Further information and the above items may be obtained by writing to the Association at 59 Westbrook Avenue, Wahroonga, NSW. 2076.

—Contributed by Barry White VK2AAB

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AMATEUR RADIO CLUB FOR CENTRAL HIGHLANDS

In early December 1986, amateur radio operators from Moranbah, Clermont, Dysart, Middlemount, Tieri and Glendon, Queensland, held on-air discussions about forming a radio club with the object of establishing a repeater to service the Central Highlands area of Queensland.

On December 21, a meeting was held and the club was officially formed. Elected office bearers for 1987 are:

President
Peter Sampson
VK4MKT, Middlemount

Vice-Presidents
Mal Lees VK4FPL, Clermont
Mark Robinson
VK4KMR, Saraji Mine

Secretary
Richie Chappel
VK4RR, Moranbah

Treasurer
Richard Burden
VK4FKB, Clermont

The *Central Highlands Amateur Radio Club* will be different from most other radio clubs in the fact that the monthly meetings will have to be held on-air due to the distances between members.

Meetings are held on the third Wednesday of each month, at 0700 UTC on 3.620 MHz, or lower, depending on QRM.

It is hoped that all members will meet in a central location for the Annual General Meeting. Membership is open to all licenced amateur radio operators, as well as any person interested in amateur radio.

Richie VK4RR, has donated a repeater to the club and, in the near future, members will be busy looking for a suitable location, and erecting the equipment. It is hoped that the two metre repeater will be operational within six months and should service the area from Blackwater/Emerald in the south to Moranbah/Glendon in the north.

For further information, contact Peter Sampson VK4MKT, PO Box 3, Middlemount, Qld. 4746.

—Contributed by Peter Sampson VK4MKT, President

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SYDNEY AMATEUR DIGITAL COMMUNICATIONS GROUP

The Sydney Amateur Digital Communications Group held its AGM on December 14, 1986. One of the main items discussed was the new DOC regulations, particularly the sections concerning amateur packet radio. It was agreed at the meeting that, since the Vancouver V2 protocol could no longer meet the DOC regulations and could not be used after March 1987, that all V2 services in the Sydney area, such as bulletin boards and digital repeater facilities, would change to AX.25 protocol.

This has the advantage of providing more facilities to the AX.25 users in the Sydney area, allowing better dispersion of information, (which is the primary function of amateur packet radio) and also bring the packeteers and packet groups around Sydney into closer co-operation. With the change over to AX.25, there will be a revision of the SADCG Digital Repeater software, which will provide various facilities for AX.25 users, such as Time, Status, Dump commands, which were previously available to V2 users.

Also discussed at the meeting was the release of various packet equipment during 1986, such as the VADCG TNC+, the HAPN IBM PC packet adaptor and a review of the HAPN 4800 baud PSK radio modem and the network implementation of Vancouver V3 protocol, both of which are due for release in the first half of 1987.

Following is a list of common amateur packet radio frequencies and modes of operation in use, as of January 1987.

HF (International)
14.103 MHz, LSB, general calling channel, AX.25, 300 baud.
14.105 MHz, LSB, bulletin boards, mailboxes, AX.25, 300 baud.
14.107 MHz, LSB, bulletin boards, mailboxes, AX.25, 300 baud.

VHF (Australia)
144.800 MHz, FM, general purpose packet, multi-protocol, 1200 baud.
147.575 MHz, FM, general purpose packet, AX.25 only, 1200 baud.
147.600 MHz, FM, general purpose packet, multi-protocol, 1200 baud.

NOTE:
300 baud is 200 Hz shift, 1600-1800 Hz (TAPR standard).
1200 baud is 1 kHz shift, 1200-2200 Hz (Bell 202). (Some areas use the 1200 baud CCITT V.23 standard).

News from New Zealand packeteers indicates that two protocols are in use there. These are AX.25 and Cambridge protocols and they are used on 147.575 and 147.600 MHz. It appears the Cambridge protocol is popular due to the high use of BBC computers in ZL. There is also much home-brew packeting due to the high cost of imports from North America.

During December 1986 and January 1987, Dave VK2YME and Wayne ZL2BKC, exchanged packets on six metres SSB using AX.25 at 1200 baud, which is a considerably large distance for VHF packeting and probably the first of many VK-ZL VHF packet contacts.

On a historical note, February 1987 marked four years of amateur packet radio in Australia. In February 1983, VK2ZXQ, Gosford, and VK2KFJ, Sydney, made the first Australian amateur packet radio contact.

—Contributed by Steven Blanche VK2KFJ, Secretary, SADCG

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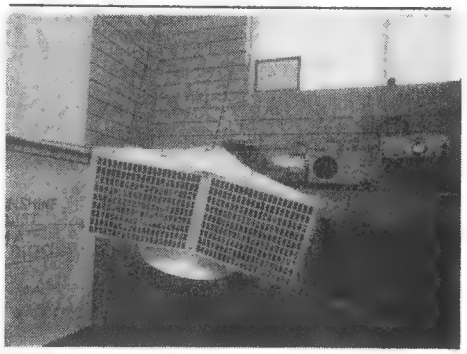

Spacecraft Model OSCAR-10 nearing completion at the QTH of VK4AGL.

MODELLING AMATEUR RADIO SATELLITES

During 1986, a decision to promote Orbiting Satellites Carrying Amateur Radio (OSCAR), was made by several members of the Sunshine Coast Amateur Radio Club. It was thought that a model would be supportive of any talks given on the subject and assistance was sought from *AMSAT-Australia*. Graham VK5AGR, National Co-ordinator of AMSAT, responded quickly with a set of drawings from *AMSAT-Deutschland*, University of Marburg. These appeared to be preliminary design drawings of OSCAR-10, but there was enough detail for members to commence the project.

Models of satellites had previously been constructed in Queensland, notably by Ken VK4KD, of the Gold Coast Radio Society, but were made of cardboard.

SCARC's decision was to make a permanent replica and the material chosen was colour-bonded aluminium. The model was constructed to half-scale, as a full- scale version would be too cumbersome to transport.

The model was fitted with antennas, to scale, made of brass rod and the simulated solar panels were produced by a local sign company using a computer- driven machine.

This model has been an effective support to talks given at the Gympie Hamfest, the Sunshine Coast's own radio club, and to local youth groups and Rotary-Probus clubs.

OSCAR-10, the first of the Phase-3 satellites, is in the last days of its operational life due to damage from cosmic radiation and the Club submits this article as a tribute to a spacecraft that has given a great deal of pleasure to Australian radio amateurs during its three-year lifetime.

—Contributed by Joe Ellis VK4AGL, Special Project Officer, SCARC

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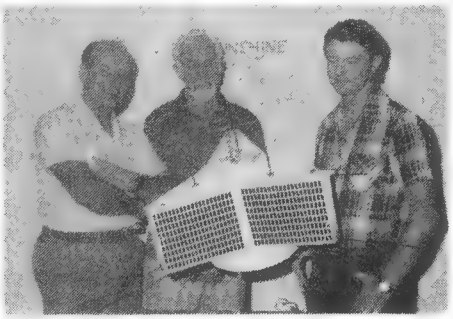

Roy VK4ARU, Club Technical Officer; Joe VK4AGL, Special Project Officer; and Paul VK4BPD, Club Secretary.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

Members are reminded that, as outlined in the February notes, the Division's Annual General Meeting will be held at 2 pm on Saturday, March 28, at the Granville RSL. A separate posting of material for this meeting will be made early this month. Please take part in the meeting if at all possible. Allow sufficient time if you have to post back anything like a proxy form or ballot paper. In past years, a number of replies arrived days, or even weeks, after the closing date. The expense of conducting the AGM is considerable, some thousands, so it is pleasing to receive a good attendance.

Members are reminded that the Federal Convention will be held in Melbourne during early May. If you, or a group you are associated with have any matter which you feel should be raised, it should be submitted, in writing, with supporting material to reach the Divisional Office by March 13. All agenda items for the Convention will be discussed at the April Conference of Clubs. Agenda items will also be covered briefly in the Sunday Broadcasts.

Clubs and groups are reminded to give a good lead-time for their field days so that it can receive maximum print publicity. Mark your calendar with the Oxley Region ARC at Port Macquarie, June holiday weekend and the South West Zone, most likely at Wagga around the end of October. Watch the *Club Corner* column for program details nearer the time Clubs need to submit copy to the AR Editor about three months before the event. Copy closes on about the 20th each month — see page one in each issue for the exact date.

From time to time Council receives a letter from a member concerned about the behaviour on some part of the amateur bands. Council is concerned about this problem and has it under constant review. It must be remembered however, that the Department of Communications is the only authority able to act on these matters. Although the Amateur Radio Service has been deregulated during recent years to become — self-regulating — it is difficult with the few who become mavericks. If they prefer not to fit in with the general harmony of a particular band or mode, their antisocial behaviour has to be addressed by the authorities. The Division has quite clear policies on these matters, often formed at the AGMs. These are publicised from time to time on Broadcasts or in these notes. One will often hear on-air comments or quotes claimed to be from the WIA. Frequently these are incorrect and if in doubt, question the person making the statement. If doubt continues please refer the matter to Council's attention. When looking at the problem and then having a look at the six points in the *Amateur's Code* it is apparent what has happened. Too many have forgotten, never knew, or do not follow the spirit of the aims. If they did, then many of the problems would not exist. Have a look at your ARRL Handbook for the full text. Briefly they are:

"The radio amateur is . . . Considerate . . . Loyal . . . Progressive . . . Friendly . . . Balanced . . . Patriotic."

NEW MEMBERS

The Division would like to welcome the following who joined as members at the start of the year. F W Baker VK2YZU, West Epping; M D Barker VK2NNI, Penrith; P J Corrigan VK2PLL, Sylvania Heights; T G Cook VK2UTC, St Clair; C G Cottle VK2MGC, Wagga Wagga; G Elijzen VK2XMM, St Marys; C H Field VK2NCF, Narwee; B J Gilmore VK2MUZ, Wagga Wagga; B J Hammond VK2NNH, Mortdale; R T Hichin Assoc, Springwood; A K Horspool VK2XBM, Orange; A P Keir VK2AAK, Seven Hills; J E Lawler VK2ALJ, Gladesville; R A Lynch VK2KAQ, Bonnyrigg; M E Maguire VK2MBD, Forestville; K C Muller VK2ACL, Penrith; J R O'Shea VK2ATU, Revesby; W J Plant VK2AMM, Maitland; S Pullan VK2TSO, Hornsby; M Van Leeuwen VK2FVL, Berkeley Vale; G A Vielhauer VK2NGA, Tighes Hill; W E Watterson Assoc, Nowra.

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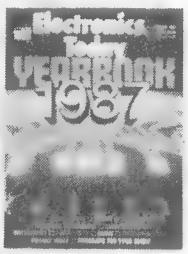

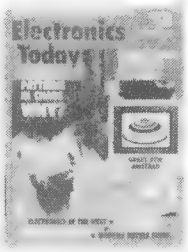

IN MARCH ETI

- Are bench top meters worth all the fuss?
- Communication in the outback — it's still the frontier.
- Buying hi-fi? Consult our Buyers' Guide to integrated systems plus our comparison of bookshelf speakers.
- Projects to build include a 16-bit computer*passive speakers* AM radio*simple amplifier, plus news, products, reviews and articles.

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VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

Bruce Mackey VK4AMV and Theo Marks VK4MU, were no doubt talking about the Sunday Morning News Relays!
Photograph courtesy VK2YL

Some of the visitors with Queensland Divisional Councillors, Paul Newman VK4APN, David Jerome VK4YAN and Ross Mutzelberg VK4IY, in the centre of the photograph.
Photograph courtesy VK4QA

Theo Marks VK4MU, Divisional Secretary and Bud Pounsett VK4QY, News Editor, were seen discussing photography during the Hamfest.
Photograph courtesy VK2YL

President of the Gold Coast Amateur Radio Society, Bill Daniel VK4AWD, addresses the large crowd who participated in the Gold Coast Hamfest in November 1986.
Photograph courtesy VK4QA

The Hamfest official opening was conducted by David Jerome VK4YAN, President of WIAQ.
Photograph courtesy VK4QA

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

Over the Summer Holiday Period, we have had our usual influx of tourists. Many interstate call signs have been heard on the repeater and a few VK ones who happened to be visitors. Adelaide was host to 900 Rover Scouts, from 14 different countries at a Scout Rover Moot, at Woodhouse, in the Adelaide Hills, for two weeks from December 26. Amateur radio was one of the activities provided and during the course of the fortnight at least 10 overseas amateur call signs were discovered amongst the participants. The local amateur radio team included such well-known identities as Don VK5ADD, Bob VK5ADR, Peter Koen, Tony VK5AH and Alister VK5ATX. The equipment in the shack had to be seen to be believed (it looked as though they had opened a new branch of "you know who's"!) and on the Tuesday afternoon, when I visited, the air conditioning was very much appreciated. I won't steal Don's thunder, as I understand he is going to write an eight-page article on it — and if you have just fainted Don, I am sure Peter can fill most of that with photographs! — but I would like to say how pleased I was to be invited to attend and my only disappointment was that I was unable to attend on the Wednesday evening when they were going to try to get all the amateurs together for an informal meeting.

However, I was pleased to meet Mick VK8KMA, from Alice Springs, Lasse (pronounced Larser) SM0KAK/VK5ALO, and especially (sorry if my prejudices are showing) Tuti YD0TTK, the only YL Peter had discovered at the time of my visit.

Another 'foreign' call sign was that of Martin G4THT/VK5AMV, who was not at the Rover Moot, but was in town to spend a month with his mother and two sisters, who live in Adelaide. I spoke by phone to Martin, who was enjoying the hospitality of Ian VK5QX, and using Ian's HF equipment to try and talk to his wife Jenny G4THU, back in the UK.

THE AMATEUR IS COURTEOUS . . .

. . . well, that's what the code says, isn't it? But it doesn't only mean being nice to all these interstate and overseas visitors. I have heard a couple of sad instances of late when repeaters users were less than courteous to local people who were doing tests of various sorts.

We, none of us, own the repeater or the frequency and "do as you would be done by" is a good maxim to live by! And, since WIA members are now obvious in the Call Book, there seems to be some "anti" feeling emerging about *them* using *our* repeater. Let us remember that it was an *amateur* frequency before the WIA (or whoever) put their repeater on it. Many amateurs are not WIA members from choice, but many more have genuine reasons, like finances, for not being a member. Some even give us a donation every now and again towards the repeaters' upkeep. Just remember next time you feel like being discourteous to someone, he might be just about to join the WIA!

On the other side of the coin, this next story has to be one of the most 'heart-warming' of our Jubilee Year, (and I hope those involved will not be embarrassed by my telling of it).

Ray VK5BRS, whom I thank sincerely for the information, was one of the staunch supporters of the Jubilee 150 Nets, as was Ron VK3AEO, in Berwick, Victoria. During one of their many contacts, Ron mentioned that Cyril VK3AUM, also from Berwick, was a white stick operator, and that he (Ron) did all of Cyril's logs for him. Ray thought it would be a nice idea to see if they could get a J150 Certificate printed in Braille for Cyril and Ron agreed. Ray then phoned Rowland VK5OU, who thought that the idea had some merit and promised to see what he could do when he received Cyril's *next* certificate application. (I don't know how many Cyril actually achieved).

A few days before Christmas Ray was delighted to hear from Ron that Cyril had indeed received his Braille Certificate and was, needless to say, thrilled with it. Those involved probably don't want thanks for what they did, but as Ray says, it shows that the Jubilee Nets were for *all,* and those involved (especially Rowland and John VK5SJ), really did go to a lot of trouble to make sure that all amateurs were recognised and catered for. Thanks anyway, to all concerned.

MATRICULATION DUX

One young man who cannot be accused of letting amateur radio interfere with his studies is Jeremy Matson VK5AY. Jeremy, whose father is Bernie VK5ABM, topped the State in the recent Matriculation Examinations. Congratulations Jeremy and good luck in your obviously bright future.

POSITION VACANT — TREASURER

I should have mentioned last month, before the nominations for Council closed, that this year we will unfortunately be losing the services of Graham VK5AGR, as Treasurer. Graham was co-opted onto Council to fill a mid- term vacancy about six years ago and, after a period as Education Officer, took up the post of Treasurer. Never one to "mince" words, Graham sometimes treads on a toe or two, but, at least you know where you stand with him. I have been grateful for his foresight and decisive thinking on many occasions and shall greatly miss working with him. Although he will be a hard act to follow, we must have a new Treasurer and, although nominations for Council have closed, we are empowered by our Constitution to co-opt a Treasurer onto Council especially for that purpose.

So, if you feel you are capable and in a position to help, please let Graham or a member of Council know!

CLUB NEWS

Just before Christmas, I was pleased to be invited to attend both the SA ATV Group's Christmas Social and the Christmas meeting of the Adelaide Hills ARS. The ATVers met at the QTH of Charlie VK5ACF, and a very pleasant evening was enjoyed by all. (Thanks also to Greg VK5ZBD, for getting me onto the ATV two metre liaison frequency after the last Broadcast before Christmas to wish them all, and have them wish me, Season's Greetings. As they couldn't actually get me on camera they did the next best thing(?) and put up the cover of December's AR in case anyone didn't know what the 'voice' looked like!

Incidentally, credit for that photo should have gone to Doug Head VK5NDH, not Peter Koen, this time.

The Adelaide Hills ARS meeting had Gordon Ragless as its Guest Speaker. Gordon was the original, but now ex-VK5GR. Although no longer active, Gordon still takes a keen interest in radio and gave us an informative and often witty look at the early days in radio and his own involvement.

Gordon was one of the founder members of the Blackwood ARC (the forerunner of the Adelaide Hills ARS). As a special surprise, the Club had gained permission from the Telecommunications Museum to borrow Gordon's original rig, which now belongs to the Museum, a gesture which I am sure both touched and delighted Gordon.

Another special guest at the same meeting was Paul Caboche 3B8AD, (and if like me you are not an avid DXer and are still wondering where 3B8 is, I will tell you that Paul is the President of the Mauritius Amateur Radio Society). I was delighted to meet Paul and learn a little about Mauritius, and some of the problems of being an amateur there. Paul has sons in Australia so hopefully we might meet again on a future visit.

DIARY DATES

Tuesday, March 24	**General Meeting — 7.45 pm.**
Tuesday, March 31	**Buy and Sell Night — 7.30 pm.**
April 24-26	**Clubs' Convention Weekend.**
Tuesday April 28	**Annual General Meeting.**

ar

Courtesy "The Propagator"

Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

COALS ARE KINDLED BY IT!

I thought readers might be interested in the following information concerning a *Third Party Traffic* message I recently passed to a mutual acquaintance in VK5, on behalf of a VK2 operator with whom I conduct regular scheds.

The cryptic message from my VK2 friend was:

"Thanks a million. *Psalms 18:8.*"

The originator of the message explained that the message had a humorous association and was also connected with something which had been sent to him. The recipient was sure to understand the meaning of the message.

Upon making the necessary telephone call to pass the massage along, I learned that my two friends had recently enjoyed dinner together at a Sydney restaurant where they served pizza. During the evening the VK2 amateur made it known that he liked his pizzas *really hot.*

My Adelaide connection then told how, just before leaving Sydney, he arranged for a pizza to be delivered to the hungry amateur. In ordering same, he asked that it be made as hot as a pizza could possibly be made.

The resultant message, to my mind, becomes one of the most effective messages of a scriptural reference that I have ever encountered.

To save you reaching for your copy of the Bible, I quote:

Psalms 18:8. "There went up a smoke out of his nostrils; and fire out of his mouth devoured: coals were kindled by it."

Yours faithfully,

Ian Hunt VK5QX,
8 Dexter Drive,
Salisbury East, SA. 5109.

ar

BACK TO THE STONE AGE

The thought provoking article by Danny VK3NG, on the Education page of December AR, posed a marketing solution to an arithmetical approach to membership based on WIA and population demographics.

Danny's ideas to get people interested are neat and well-founded, but I fear, not based on a person's wants and needs, which is really what the graphs address. In my work I see all kinds of outcomes from the mix of wants and needs. In my opinion, it is not money or the lack of it which is the problem, nor is it wholly the type of social interaction of the young either. Let me explain.

First, when a young person (in employment) puts up $10 000 for a share in a Sailing Yacht, $2000 for a computer, $2500 into a Hi-Fi or $6000 plus into a motor car, as many of then do — they are investing in their wants. They are "things" or peer group artifacts in their communication with one another. Talking about rock stars and television shows comes cheaper, but they are essentially the same. When (say) matrimony supervenes, their wants change to real estate and furnishings, as do their social needs.

Second, as to those social needs, my 24 year old son (who helps me a lot with my hobby) put it succinctly by saying; "If I wanted to make a contact like you do, I'd make a random 'phone call." In our mature years our social wants and needs change as we recognise the importance of and satisfaction we get from inter-personal contacts with others, including fellow hobbyists. What the graph says is that, at about age 40, we amateurs have some spare cash and our wants are satisfied by both the social and skill side of our hobby.

Third, I disagree with Danny on stepping back into the Stone Age by CWing on 80 metres. I haven't met anyone yet who was not "switched on" by acquiring a new skill. By all means let us encourage the young by the means he suggests.

Our future, for which I do not hold any fears, lies in making a high impact on as many impressionable teenagers as we can, so that, after they get all their fads, fancies and family responsibilities out of their system, they will turn naturally to amateur radio for a satisfying hobby — which will satisfy their wants and needs.

Yours faithfully,

Alan Smith VK2BHF,
10 Banool Avenue,
St Ives, NSW. 2075.

ar

WICEN NEUROTICS

I see that WICEN's most vociferous member has started the year with a full set of "Exocets" (see Jan AR, p61).

Over the years I have noticed Mr Gabriel's (VK4YG) continuous psychological attack on a group of Australian amateurs who choose to call themselves the *Australian Traffic Net.*

The members of the ATN have tried unsuccessfully to present their views: unsuccessfully because, Mr Gabriel's mission is pure seek and destroy!

If Mr Gabriel is allowed to seek and destroy a legitimate amateur net, a group who cause no interference to others, perhaps he will next turn his attention to DX nets — "Look out Jim Smith!"

The Australian Traffic Net is just a group of dedicated Australian amateurs who offer their time and equipment free to ensure that Australia has an established system to work other International Traffic Networks. Any amateur or group may operate such a system or net for what-so-ever reason providing it is within the licence conditions. No doubt the Department of Communications is indeed most grateful to have an unpaid moral policeman on their staff!

I am sure that most WICEN members wish their upstanding and dedicated organisation did not have to be associated with Gabriel's problems.

It is obvious that the publicity the ATN is able to obtain through its excellent service and dedicated members is driving him out of his mind.

Australia is, so far, a democratic country. Freedom of the press is everyone's democratic right!

A D Tregale VK3QQ
Ex G3LMT, DL2AH, MP4BDN, 9L1AT
73 Nepean Street,
Watsonia, Vic. 3087.

ar

VK4 WICEN CO-ORDINATOR'S REPLY TO PREVIOUS LETTER

Receipt is acknowledged, with thanks, of your letter dated January 2, 1987, under the heading *WICEN Neurotics.*

It is considered that the heading is rather inapt as the views expressed at various times in AR by My Gabriel VK4YG, are his own personal views and not necessarily those of the WICEN organisation.

(A letter from me, dated September 10, 1982, was addressed to Mr Gabriel expressing the wish that such criticisms of the ATN should be purely on a personal basis.)

Queensland WICEN acknowledges the existence of the ATN networks and consider that Mr Voron VK2BVS, is a dedicated amateur doing a very useful service in his particular sphere. We have, in fact, given him as much assistance as possible in explaining to the amateurs of Queensland the difference between WICEN and ATN, this is evident from the WICEN column in the Queensland Newsletter headed "WICEN in a Nutshell" (see WICEN column this issue of AR for a re-print of this article), which was distributed in quantity to all Queensland radio clubs, all WICEN officers and was also distributed at two major Hamfests.

Further, Queensland has exchanged training manuals so that both organisations are familiar with the two different formats, but it should be again emphasised that WICEN in Queensland will only use the accepted format of message handling as laid down by the Federal WICEN Co-ordinators, similar to the Civil Defence. Any traffic accepted by the ATN from overseas, if of an urgent nature, for Queensland would be accepted by WICEN provided the format was transposed to agree with ours, and that a recognised disaster or emergency was in force.

As you are doubtless aware, our prime aim is to provide back-up communications for the authorities during a disaster or emergency and to have a point of contact into, or out of, every town or city in Queensland.

To achieve this, we have some 50 towns which have a WICEN officer whose duty is to provide that essential function should other communications fail. He is also responsible to see that a local group is formed to assist the authorities as required.

Again, the third party organisation does not fill an important gap providing welfare traffic facilities for individuals and does not encroach on WICEN which is concerned more with official emergency traffic for the authorities.

Thank you for your interest,

Kind regards and 73,

Ken Ayres VK4KD,
State WICEN Co-ordinator,
WIA (Queensland Division),
Box 638, GPO,
Brisbane, Qld. 4001.

ar

GIVE ATN BASHING A REST

I've followed with increasing concern the many letters on the operation and purpose of the Australian Traffic Net. I note that many of the adverse comments appear to come from WICEN members, and/or "old timers" who seem to think the 30 years in radio is the prerequisite that makes them a VK authority on all facets of amateur radio.

For those that would now question my "experience", I was a military telegraphist for a mere 25 years and have the distinction of being told recently that my six year in AR makes me a newcomer to radio. I am neither involved in the ATN or WICEN.

Both the ATN and WICEN provide a useful service, the former handling third party traffic both within VK and overseas, and the latter in providing emergency links when activated by the relevant authority. The two organisations are distinctly different in purpose and to suggest that one should leave the ATN and join WICEN to learn anything is patently ridiculous. To lambaste the ATN for providing third party traffic communications during international disasters because it has the temerity to use the words "emergency traffic" is ridiculous in the extreme. If nothing else, the ATN allows the message writer to know that they have done everything possible to communicate with their loved ones when disaster disrupts civil links and that must count for something.

The ATN has, on several occasions in recent years, gained favourable national media coverage and thus provided mush needed publicity for AR. I do not see other facets of our hobby, with the exception of the Jubilee of South Australia Awards Program, gaining that much needed publicity regardless of how experienced they see themselves. I can only surmise that they are green with envy!

I, for one, would like to see ATN bashing given a rest and your erstwhile correspondents focus their attention on some other facet of AR like packet radio, ATV, award hunters, RTTY, or even that sacred cow, WICEN.

Yours sincerely,

Grahame Parsons VK2DUP,
6 Eagle Place,
Sanctuary Point, NSW. 2540.

ar

CONGRATULATIONS

Congratulations on *Amateur Radio.* It is a fine magazine and of world standard. I believe it to be better than *QST* and *CQ* to which I subscribe.

73,

Frank Doherty VK1XE,
30 Lumeah Street,
Narrabundah, ACT. 2604.

ar

ANTI-TECHNICAL

I am writing in response to a letter from Ross Cummins VK2CRJ, published on page 61 of the December issue of AR.

I have followed with interest the various articles and letters proposing changes to the system of amateur licensing in Australia. Some of the proposals put forward are, in my opinion, sensible and feasible whilst other, I feel, are blatantly silly. Mr Cummins' letter however takes the cake!

There is certainly a consensus that something must be done to arrest the apparent decline in the number of people entering the hobby of amateur radio but I cannot help feeling that some of the opinions expressed are based on purely selfish motives. Too many amateurs are looking at how changes will affect them personally and ignoring the fact that if the hobby continues to decline they will be in danger of losing their coveted spectrum to non-amateur interests.

It is, in part, this short-sighted attitude which has prompted me to reply to Mr Cummins but I am most annoyed and concerned with his "anti-technical" attitude.

Not too long ago the limited licensee was regarded as the technical "whiz- kid" of amateur radio. These were the people experimenting with the new modes and difficult frequencies and who often had no interest in the familiar technology of HF.

In more recent times some amateurs have come to regard the limited licensee as a second class operator who doesn't have the ability or strength of character to achieve a full call. Nothing could be further from the truth. Some of the most technically competent amateurs I know are satisfied with the scope provided by the limited licence. They have developed their operating skills through their interest in weak signal VHF and UHF DX, satellite and EME operation and the like. Many now use CW as an extra mode since this has been allowed but still few see the need to obtain a full call.

How dare Mr Cummins suggest that a "technician" class licence or, as he puts it, "an up-market limited operator" is something undesirable on the amateur bands. I have recently upgraded from a limited licence (November 1986) and I object to the intimation that 10 words per minute Morse has elevated me to the exalted heights of which Mr Cummins sees himself. Considering that it took "years of study" for Mr Cummins to obtain his "zenith" in the form of a full licence I would suggest that most limited licensees that I know have forgotten more about radio theory than he will ever know!

I would remind Mr Cummins that amateur radio is essentially a technical hobby. I could take an equally narrow view and state that anyone who simply wants to operate a radio with no particular interest in the technicalities should stick to CB, but I believe that there is, or should be, a place for every type of interest within the amateur service.

For Mr Cummins to state that those whose interest is in the technical area should operate QRP into a dummy load for the betterment of the hobby and to save his precious spectrum is both abhorrent and totally at odds with my perception of what amateur is about. It would be equally as stupid for me to suggest that anyone who only wanted to improve his operating skills should forget about radio and operate into a tape recorder.

I believe that amateur radio has a future provided as many people from as many different interest groups as possible can gain access to the hobby from a wide number of entry points. I also believe there will be problems as long as there are people like Mr Cummins who, with his "I, me, mine" attitude, wish to blow their trumpet about their full call and impeccable operating skills by writing ill-conceived letters to magazines.

Andrew Keir VK2AAK ex VK2XKK,
174 Frederick Street,
Seven Hills, NSW. 2147.
ar

NO RESPONSE?

I had hoped that there would be more response to my letter printed in AR last June. It would be really helpful to me if somebody could come up with some real, factual information about the Psychology of Teaching and Learning Morse Code.

Many people hold strong beliefs on this subject based on their own experience but they tend to denigrate those whose experience doesn't agree with their own. It is fine to hold strong views but if you cannot back them up with valid arguments they may have little value. The suggestion was made recently that the only requirement necessary for learning Morse code is regular daily practice. The *only* requirement?

Another recent comment was to the effect that the idea of starting newcomers with simple CW gear shows "conservative and backward thinking". Maybe he is right, especially if aiming at 16 year olds as mentioned. He would also find some difficulty in getting schools to introduce a course on amateur radio into their curriculum, especially at year 12 level. But maybe he is wrong.

Let's take another tack. If we believe that our hobby is interesting, fun and a way of meeting with people who are good to know then let's think about starting to introduce it to kids before they are too heavily burdened with school work or already set in their interest patterns and the allied peer groups which go with those interests.

I was introduced to things electrical at the age of 10 because a garage mechanic cared enough to wind me a low voltage transformer to experiment with. Nowadays, we can start with a battery or two and some transistors, etc — much safer too. Science teachers in schools are finding that often the lack of interest in science as a profession is because we have not fired the imagination of kids early enough; ie in our primary schools.

Another point, kids of eight to 10 are possibly quite interested in the idea of having their own "special" language — Morse. We're back there again. But do we really know how best to teach Morse? If we do, why are there so many amateurs who don't use it? Let's leave the name calling and adjectives aside for a while. Just suppose that people who refrain from using Morse are not all lazy or stupid. Let's not bring in comparisons like learning to walk etc, unless we can demonstrate valid experimental connection between that and learning Morse code.

Education has made many valid strides in recent years and it seems easy to believe that there may be more effective ways of teaching Morse code if we look for them. Although many kids may not have useful computers at home, most primary and other schools do and this could be a basis for more useful courses.

Morse code and low cost simple equipment go hand in hand. Perhaps we could even look at a special licence with a QRP transmitter — say five watts total DC input (easily measured) with crystal control (VXO). That, with a simple direct conversion receiver could be the starting point for a life-long interest.

One final plea. If anyone has access to modern experimentally derived information on the *Psychology of Learning and Teaching Morse Code* will they please get in touch with me.

Neil Trainor VK3IJ,
133 Bladin Street,
Laverton, Vic. 3028.
ar

VISITING FROM OVERSEAS

Visiting relatives in Australia, I was surprised to notice on a board, while visiting the Telecom Museum in Adelaide, one of my QSL cards, VQ8AS, amongst a batch donated by V R P Cook VK5AC, to the museum. The QSO took place 49 years ago on December 10, 1932. I was, at that time, 17 years old and working for a company on one of the islands forming part of the Chagos Archipelago — Solomon Islands. The Chagos is positioned on the map about 72 degrees east and five degrees south in the middle of the Indian Ocean. I was using a TPTG transmitter with an Osram valve, PX4, supplied from a bank of 110 volt batteries. The input power was four watts into a modified Zepp antenna.

It was the very good old days where I used to have a regular sched with Ron Mitchell VK2AGJ and Ramsay VK4AB, on 20 metres (do any readers know if these two gentlemen are still alive?). Unfortunately, VK5AC passed away about four years ago, according to information given to me by the OM in attendance at the museum, whom I sincerely thank for the help given to me and for allowing me to take photographs of the board and equipment used by VK5AC at that time.

I returned to Mauritius in 1938 and, when war broke out, I was called-up to the Navy and sent back to the Chagos, this time to the island of Diego Garcia, where I was in charge of telecommunications.

I had the opportunity of meeting some Australians in the RAF/RAAF and also aboard the auxiliary Australian ship *Kanimbla*. (I was most interested to read the article by Joe VK2BJX in *Listening Around,* December AR about the above ship).

Diego Garcia is now an American base and many American amateurs are stationed there using the prefix VQ9. . .

I would also like to thank, through the pages of AR, the members of the South Australian Blackwood Amateur Radio Club for their kind hospitality.

73 to all.

Paul Caboche 3B8AD ex-VQ8AS,
PO Box 462,
Port Louis,
Mauritius.
ar

CALL BOOK CONGRATULATIONS

I wish to express my congratulations on the production of the latest Call Book, particularly the innovation of indicating membership of the WIA against an operator's call sign.

Apart from allowing me to be aware of the fact that I am speaking to a fellow member, I now have the benefit when checking the listings of knowing which of the details are more likely to be correct and accurate.

I am aware that the Institute's membership listing is the source for this information in the Call Book and as members virtually have communication with the Institute on a monthly basis (by virtue of the receipt of *Amateur Radio*), this constant communication must result in records being updated on a regular basis.

It is not my intention to criticise the balance of the listings supplied by DOC, however I doubt that the Department has such regular communication with individuals as does the WIA.

The listing as currently presented also has the advantage that knowing that the person you are talking to is a member and in receipt of *Amateur Radio* you can probably assume that he is more correctly informed as to amateur radio matters than would otherwise be the case.

After some years of discussion regarding implementing this format I am glad to see that it has been effected. Once again congratulations on an excellent production.

73,

Ian Hunt VK5QX,
8 Dexter Drive,
Salisbury East, SA. 5109.
ar

REMEMBRANCE DAY CONTEST SCORING

The publication of the RD Contest results and discussions I have had with Ian Hunt VK5QX, over the last two years, together with a recent conversation with Ron Henderson VK1RH, has motivated me to put together some ideas I have had on how the contest is scored.

This contest is called the "friendly contest" and one aim is to get a lot of amateurs on the air. Two factors are therefore important — participation and activity. A third — a weighting factor — is necessary to try to give each state or territory a fair chance of winning.

The present scheme measures:

a participation by dividing the number of contestants from each area by the total number of licenses issued in that area; and

b activity by dividing total points from an area by the number of contestants from that area.

Each of these on its own is a good measure of either participation or activity but when you put them together you lose the effect of the number of contestants,

ie gross score = participation x activity =

$$\frac{\text{Number of Contestants}}{\text{Number of Licenses}} \times \frac{\text{Total Points}}{\text{Number of Contestants}} = \frac{\text{Total Points}}{\text{Number of Licenses}}$$

This arises because number of contestants is used twice. I feel it best to use participation as presently defined, but use total points as a measure of activity. In this way many contestants with high scores is a sure way to get a high gross score.

The third factor, to even out the states differing amateur population, is a weighting factor and is worked out in advance by looking at previous years results. This has the effect of giving a better chance to states who greatly increase their gross scores over previous years. The present prediction uses a 10 year linear fit and requires some higher mathematics to calculate. I feel we should use a simpler method and only look at the last four or five years data, a simple average of the last four years actually achieved weighting factors should do quite well.

In order to show how this would all work out, I have taken data from the article by VK1RH on the RD Contest Scoring System in AR of August 1986, and calculated weighting factors using a four year average. In the Table, P is points scored, P/F participation factor and G/S is gross score.

If these weighting factors had been used in the 1986 contest, the results would have been:

VK1 502974; VK2 401571; VK3 155874; VK4 321475; VK5 106338; VK6 187750; VK7 140239; VK8 256620.

Well, think it over and let your Division have your reaction.

Colwyn Low VK5UE,
34 Hawker Crescent,
Elizabeth East, SA. 5112.
ar

		82	83	84	85	86
VK1	P	9881	6510	5440	5346	6324
	P/F	11.6	9.3	10.8	17.6	18.2
	G/S	114619	60543	58752	94090	115097
VK2	P	1716	12236	14964	12638	13798
	P/F	2.8	2.1	1.9	1.8	2.72
	G/S	48048	25695	28432	22748	37530
VK3	P	23111	17510	15240	14157	10252
	P/F	2.6	2.1	2.9	2.7	2.03
	G/S	60088	36771	44196	38224	20811
VK4	P	12444	10010	9555	6624	9788
	P/F	4.8	3.3	2.7	2.8	3.4
	G/S	59731	33033	25799	18547	33279
VK5	P	42350	36284	24320	16616	15638
	P/F	13.8	11.9	9.4	7.7	6.8
	G/S	584430	431780	228608	127943	106338
VK6	P	33360	21432	13824	12870	13400
	P/F	11.8	11.5	7.3	8.2	8.34
	G/S	393648	246468	100915	105534	111756
VK7	P	11840	7392	4847	2860	3719
	P/F	13.7	9.2	6.8	4.5	5.62
	G/S	162208	68006	32960	12870	20900
VK8	P	1287	1910	450	122	263
	P/F	5.4	6.0	3.8	1.2	3.46
	G/S	6949	11460	1710	146.4	910

Table 1 — Points Scored, Participation Factor and Gross Score.

	82	83	84	85	86
VK1	5.10	7.13	3.89	1.36	1.00
VK2	12.20	16.80	8.04	5.62	3.07
VK3	9.73	11.7	5.17	3.35	5.53
VK4	9.78	13.10	8.86	6.90	3.46
VK5	1.00	1.00	1.00	1.00	1.08
VK6	1.48	1.75	2.27	1.21	1.03
VK7	3.60	6.35	6.94	9.94	5.51
VK8	84.10	37.70	134	874	126

Table 2 — Achieved Weighting Factors.

	To be applied in 1986	To be applied in 1987
VK1	4.37	3.35
VK2	10.70	8.38
VK3	7.49	6.44
VK4	9.66	8.08
VK5	1.00	1.02
VK6	1.68	1.56
VK7	6.71	7.19
VK8	282	292

Table 3 — Four Year Averaged Weighting Factors.

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Silent Keys

It is with deep regret we record the passing of —

MR R V BARRINGER	VK2RR
MR A K BRADFORD	VK4KK
MR E M CLYNE	VK3HZ
MR DAVE DUFF	VK2EO
MR C J FOWLER	VK3ACF

Obituaries

GEOFFREY CLAY VK2ECA

The sudden death on Wednesday, November 26, of Geoff VK2ECA, aged 61, came as a great shock to his many amateur radio friends.

Although he had been in indifferent health for some months, Geoff had still been his cheerful self right up to the day of his passing.

Geoff Clay had spent most of his life in Cessnock and Paxton, and was closely associated with the mining industry. During the war, he was a telegraphist aboard the ill fated HMAS *Arunta* during the Pacific Campaign. Although he suffered extensive injuries in this encounter he returned to the work force at the cessation of hostilities. A mine accident caused his early retirement from work and left him with serious disabilities about which he never complained.

Geoff took up amateur radio in the late 70s and became licensed as VK2PBN in 1981. He later held the call sign VK2KLA, and soon afterwards VK2ECA. He was a keen CW operator and had many DX awards to his credit. Meticulous attention to detail in his model shack and his efficient antenna farm assured him of a clean and big signal using moderate power.

He was an idealist with strong views but a very kind nature. He had keen interests in gardening and reading and his wide knowledge on a variety of subjects was evident in his informed conversation.

The quiet funeral service at Cessnock was attended by former ship-mates and a large number of his radio amateur friends, young and old alike.

Geoff Clay leaves his wife Dot, and a vast circle of amateur radio friends, all of whom greatly mourn his loss.

Keith Howard VK2AKX

HEINZ FRANZ PADBERG VK2DGK

Members throughout the Hunter area, as well as his many German speaking friends all over Australia were saddened to hear of the passing of Heinz VK2DGK. He had been admitted to hospital for observation and had only been in intensive care for a short time when a complication in his condition on December 18, brought about his sudden death as the age of just 66.

No doubt Heinz will be remembered by most of his Australia-wide radio amateur friends because of his activities in the Saturday morning German speaking net which he commenced in about 1980. However, many of those whose early careers took them to the BHP works in Newcastle will remember Heinz and value his help when he worked in a supervisory capacity in the electrical apprentice school for many years following his arrival in Australia as a migrant.

Heinz had been associated with radio and electronics since his school-days in Germany and it is believed that he held a DL-licence at the time that he was working for the US air force during the days of the restoration of his country following the war.

It was his youngest son who prompted him to become a full call licensee here. He had first qualified as a novice with the call sign VK2VME, and he upgraded to VK2DGK in 1979. He was a keen computer operator and was responsible for many original ideas in this field. He lectured for some time at the Maitland Radio Club and helped many gain their licenses. Heinz was a talented musician and, being a very practical man, could turn his hand to almost anything associated with radio.

A large gathering of relatives and friends, many of them radio amateurs, attended the funeral held at Beresfield on December 22, 1986.

Heinz is survived by his sons Detleef (Pat) VK2KEX and Ulrich (Don) VK5PPD, and daughter Joyce. His cheery voice and helpful counsel will be sadly missed by his many friends both on and off air.

L Kentish VK2CFK

HARRY RAYMOND CARTER VK2HC

It is with deep regret that we record the passing of Harry Raymond Carter MBE, VK2HC, on November 27, 1986. aged 75 years.

Ray was born in Quirindi on October 13, 1911. He obtained his experimental licence while still at school in Armidale, in September 1926. His call sign OA2HC, was used to work F8GM with 20 watts — his first European QSO.

His age and isolation, 56 km from town, did not deter his interest with Morse code being learned from Coastal Shipping. He was very active on CW with many firsts and awards to his credit.

Harry was released from rural work and joined the RAAF. He continued training in Morse at Bradfield Park and Richmond Air Base, attaining the rank of Flight Lieutenant by the end of hostilities.

He was instrumental in introducing Field Radio into Bush-Fire Brigades and was a member of the Tamarang Shire Council for over 20 years (17 as Shire President). He was a member of the Cunningham and Central Northern County Councils and was also a participant of the Quirindi Historical Society, to which he made a large contribution by writing and printing a book on local history.

For his community work, Harry was awarded an MBE.

His country property, *Amaroo* was his greatest interest and he was involved in running it right up to the end.

He will be sorely missed by his son Tony, daughters Elsie and Leonie and all of their respective families, not to mention amateur radio.

Peter Ritchie VK2ESP

PIETER VAN LOUWERSEN VK2BDL

My late husband, Pieter, was a very keen member of the WIA. He spent many happy hours contacting friends and people all over the world and received over 53 certificates for contests in various states and countries. He also has over 5000 QSL cards from world-wide radio contacts.

Pieter attended the Dutch Naval College and became a fully qualified radio telegraphy officer. He had just finished his National Service in the Dutch Navy when war was declared. He travelled to England and joined firstly an English vessel then a French one, prior to the Dutch forming their Navy.

He then joined the *Heemskerk* and did convoy duty through the mine- fields in the North Atlantic. His next posting was to the Middle East and the Indian Ocean. He served with the Australian forces at Post 6, Mauroke in the Secret Service before receiving his honourable discharge at the end of hostilities.

He was a very clever and intellectual man — he attended University after his discharge and attained his Bachelor of Engineering Degree. He joined the WC and IC, where he became head of the materials testing laboratory and was held in high esteem by those who worked under him, helping and coaching his staff in his own time.

Not only brave during the war, he bravely fought his last battle with cancer for the past two years, finally succumbing to his illness on November 9, 1986.

Pieter lives on in his son Karl and his clever little grand-daughter, Tanya. He is sadly missed by his wife after 43 years of marriage, and by Karl, Diane and Tanya.

Contributed by (Mrs) Veda van Louwersen

WILL COLLIS VK2VJC

Our son, Will VK2VJC, passed away on December 22, 1986, as a result of a freak accident. He was 33 years old and worked for Telecom.

Will's interest in amateur radio began in 1978 when we passed the Novice examination together. Although not very active on-air due to other commitments, Will had many friends in the amateur fraternity, and was always available with help and advice.

He assisted with JOTA in Wellington for a number of years, and was Secretary of the Yeoval Radio Social Club, VK2CYR. The Club was designed to create an interest in amateur radio.

Will was a wonderful son, loving husband and good father who is sadly missed by his wife Jenny, children Jonathan (6), Benjamin (3) and Natasha (2), also his own family, workmates and many friends.

Contributed by Joy Collis VK2EBX

COMPUTER SERVICE BOOM

O Fixing broken computers, repairing medical equipment, industrial robots and a wide range of high technology gear is a growing area in the United States.

According to a study by a research and consulting firm, the high-tech servicing industry will grow at least 13 percent a year compared with computer sales at around seven percent.

The proliferation of personal computers throughout the workplace and corporate networking has increased the demands for maintenance and repair.

Equipment makers and independent service companies are gearing up to exploit the growing opportunities.

Service personnel are finding it vital to keep abreast of a dizzying array of technology an products, requiring them to undergo advanced training and education.

SOVIETS GO STATESIDE?

O The United States is considering giving the Soviet Union access to the medium wave broadcast band within its own country in return for Voice of America shortwave Russian-language broadcasts being free from jamming.

The director of the US Information Agency, which runs VOA, says response from several US commercial broadcasters has been encouraging.

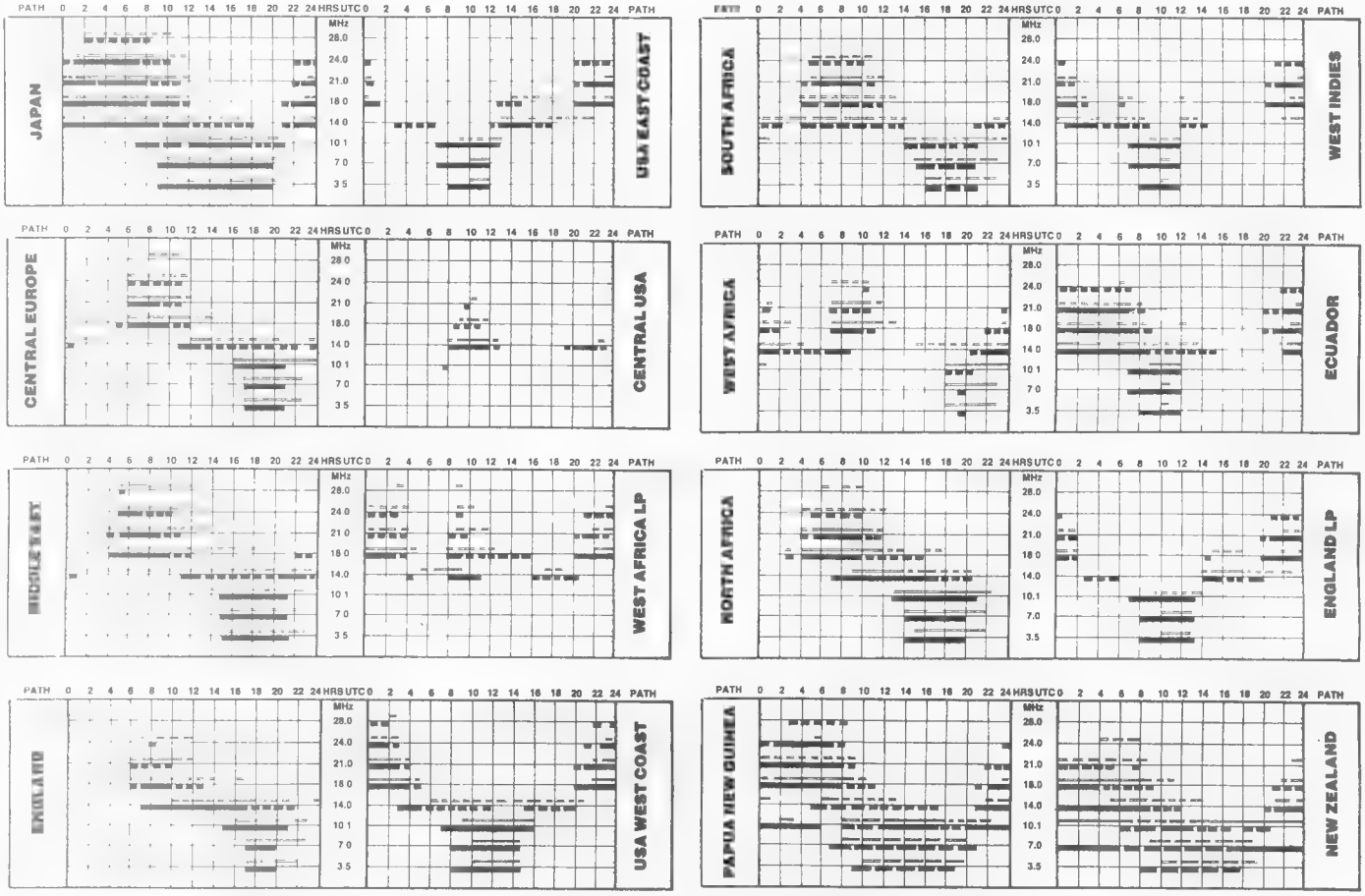
He says the idea was discussed with the Russians during September's summit meeting between the US President and the Soviet Leader.

The Kremlin chief in a television broadcast later said he had offered President Reagan an end to jamming of VOA transmissions to the Soviet Union in return for broadcast facilities on, or near US territory.

Moscow wants medium wave band outlets because few Americans have shortwave receivers.

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060


PATH 0 2 4 6 8 10 12 14 16 18 20 22 24 HRS UTC 0 2 4 6 8 10 12 14 16 18 20 22 24 PATH
MHz 28.0 24.0 21.0 18.0 14.0 10.1 7.0 3.5
JAPAN
USA EAST COAST
SOUTH AFRICA
WEST INDIES
CENTRAL EUROPE
CENTRAL USA
WEST AFRICA
ECUADOR
MIDDLE EAST
WEST AFRICA LP
NORTH AFRICA
ENGLAND LP
ENGLAND
USA WEST COAST
PAPUA NEW GUINEA
NEW ZEALAND

LEGEND
From Western Australia (Perth)
From Eastern Australia (Canberra)

Mixed mode dependent on angle of radiation (long broken lines).

Better than 50% of the month, but not every day (continuous lines)

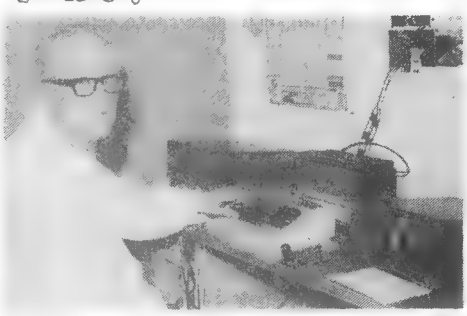
All paths unless otherwise indicated; (ie LP = Long Path) are Short Path.

Less than 50% of the month (short broken lines).

Predictions are presented courtesy of the Department of Science, IPS Radio and Space Services, Sydney.

Thumbnail Sketches

Vic Joyce VK2EVJ
17 Prescott Avenue, Dee Why, NSW. 2099.



JACK PICKLES VK2YK
A legend in his own lifetime

Jack has earned the friendship and high regard of hundreds of CW operators through monitoring and QSOs on 7.025 MHz. You could always depend on him for a QSO or to pass a message to other *customers*. When Jack and Peter VK2PA, got together for their daily sessions everyone was treated to a tremendous example of top-class QSK CW operating and the opportunity to practice copying high speeds — 50 WPM was common, with excursions higher! ! !

Jack was educated at a private school in Newcastle and subsequently at Avondale Adventist College. He had in mind to become a missionary, but could not resist meat pies! He then did the Marconi School's correspondence course and commenced his career as a Radio Officer on a Red Funnel trawler.

At one stage, Jack was employed on a Norwegian Whaler and journeyed to the Antarctic where he also flew their Walrus flying boat scout plane.

During World War II, he served in a special unit and suffered badly at the hands of the enemy.

After the war, Jack joined DCA and, during 20 years in their employ, served in the Northern Territory, Queensland and New South Wales. He was also an active sharebroker during the mineral boom.

Jack was first licenced as VK2QV, in 1934. He became VK5QV whilst in the Northern Territory, then VK2AAR upon returning to New South Wales prior to receiving his present call sign. He used a *bug* and became known as *Piccolo Pete* because of the few extra dots he would throw into his transmissions. Eventually, he got a keyboard from Alan VK2BF, and never looked back.

During his 20 years on 7.025 MHz, he became an institution and provided thousands of contacts and has been a source of company for all and sundry looking for a CW contact. There were many occasions when he was able to help yachts in difficulty.

Jack is very appreciative of all who have made amateur radio such a satisfying hobby for him.

Recently, Jack has been having a rough time with his health and, as a result, has been sorely missed on 7.025. The main business on the frequency has been the state of Jack's health as all inquire after him.

Jack has been in the good hands of Dick VK2BKH, who lives nearby and has been a tower of strength to him.

I know I speak for many people when I say: "Thanks Jack" and wish him a good recovery and a lot more pleasure on 7.025. It would be great for him to win some pies back from Peter VK2PA!

STOLEN EQUIPMENT REGISTER

Peter Gamble VK3YRP
6 Bath Road, Burwood, Vic. 3125

In accordance with the 1984 Federal Convention Motion (84:17:01), a *Stolen Equipment Register* was established at the Federal Office. Periodically lists were printed in AR, however, it is some time since a consolidated list was printed.

The register has now been set up by the Federal Office as a data base. The list has been sorted according to three keys:

Date Stolen
Manufacturer
Owner

and copies of all three lists have been distributed to each Division. Updates will be distributed to the Divisions and printed in AR as they come to hand.

Members wishing to take advantage of this register, either to publicise their loss or to check equipment offered to them, may write or telephone the Federal Office. Telephone reports of stolen equipment should be followed up with confirmation in writing giving the manufacturers name, type of equipment, serial number, date stolen, owners name, address and call sign. Also a note of any distinguishing characteristics or modifications.

Would you also please ensure that the Federal Office is notified promptly when equipment is recovered. If you have equipment on the following list, please check the details and advise the Federal Office if there is any errors in the following list.

MODEL	SERIAL NO	OWNER	DATE STOLEN	COMMENTS
ICOM				
IC2A	04484	VK1MX	*21.01.85*	Vinyl Case
IC2A	09665	VK4NME	*29.01.86*	
IC2A	12213830	VK3YOD	*02.12.83*	Spare battery pack
IC2A	12215146	VK3CRH	*21.06.83*	
IC02A	29901052	VK2CKD	*05.02.86*	
IC4E	18103021	VK3YOD	*02.12.83*	Spare battery pack
IC22	12266	VK3BLC	*29.04.85*	
IC22A	1914	VK4ZSH	*03.09.85*	
IC22A	8853	VK3ZU	*03.05.84*	
IC22S	14727	VK3ME	*14.08.85*	Extensive modifications
IC22S	14957	VK3DYZ	*11.09.84*	
IC22S	62014533	VK3KAW	*23.12.85*	
IC25A	03831	VK2DPM	*04.11.84*	VFO modified
IC45A	01876	VK2DPM	*04.11.84*	
IC45A	18351005	VK3KJC	*22.02.84*	Memory b/u unit
IC202	41013616	VK3ZBI	*00.10.85*	
IC202	5144	VK4ZSH	*03.09.85*	
IC211	6804309	VK3BRV	*17.10.84*	
IC215	05156	VK2AMX	*20.11.84*	
IC251	01106	VK4ZSH	*03.09.85*	
IC290H	17701965	VK3ZBI	*00.10.85*	
IC290H	17703342	Emtronics	*17.02.86*	
IC490A	16101192	VK3BVO	*00.03.83*	
IC551	01273	VK4ZSH	*03.09.85*	Includes FM, VOX
IC551	9401253	VK3ZBI	*00.10.85*	
IC551-D	99003878	VK3YSG	*01.01.84*	
IC720A	06242	VK4ZSH	*03.09.85*	
IC730	13806798	Mel Uni	*18.09.85*	Home-brew power supply
IC735	36304455	Emtronics	*17.02.86*	
ICPS20	10101966	VK3YSG	*01.01.84*	
KENWOOD				
AT-200	820049	VK2DCB	*16.08.84*	
DG5	730475	VK2DCB	*16.08.84*	
SP520		VK2DCB	*16.08.84*	
TR2400	0061926	VK2PJ	*20.04.85*	Call sign engraved
TR2400	0061950	VK2DPM	*28.08.84*	
TR2500	3040009	VK2ZQC	*29.05.85*	Also mic, charger
TR2600A	7030631	VK5AAR	*03.10.86*	
TR7850	1111125	VK2CCK	*07.02.86*	
TR7850	202080	VK2DED	*06.03.84*	"N" antenna connector
TR7950	4010747	VK2TVG	*08.08.85*	
TR9000	1020527	VK2KAH	*03.01.87*	Has mods
TR9000	1050780	VK3YSG	*01.01.84*	
TS120V	0081224600	VK2VWN	*03.05.85*	MC35 mic
TS130SE	2060697	VK2KAH	*03.01.87*	Includes WARC bands
TS430S	4010322	VK2XJC	*15.05.85*	Includes FM, filter
TS520S	820972	VK2DCB	*16.08.84*	
TS930S	3050176	VK7JG	*13.01.83*	
VFO-520		VK2DCB	*16.08.84*	
YAESU				
FC707	11140775	VK2DBB	*28.04.86*	
FRG7	299L26099	VK3ZLY	*28.07.83*	
FT101	34224	VK2DC	*18.08.85*	
FT101E	8G350283	VK2SS	*29.06.84*	
FT101E	8L370414	VK3DYZ	*11.09.84*	
FT200	2K332252	VK3DYZ	*11.09.84*	
FT203R	4H081794	DSE Vic	*13.05.85*	
FT207R	10132725	VK2EMC	*04.03.85*	Batt cover missing
FT208R	3N350964	VK2CBA	*30.07.85*	
FT209R	4E360554	VK3KGH	*00.06.85*	Vinyl case
FT209R	4L06245	DSE Vic	*13.05.85*	
FT209RH	4K050838	VK3CE	*00.00.85*	Blue vinyl case
FT209RH	5K190401	VK2HW	*21.02.86*	Leather case
FT290R	1L081321	VK3KJC	*22.02.84*	
FT290R	1M081340	VK2VE	*04.01.87*	With carry case & nicads. Owners name on front of unit as well as inside case
FT290R	3C260713	VK2EGD	*12.11.86*	
FT480R	1H12069	VK1ZUR	*29.05.84*	
FT620	010489	VK4ZSH	*03.09.85*	
FT680R	3H080202	VK2XJC	*15.05.85*	
FT7	81090839	VK3BYK	*28.06.83*	
FT7	8I090728	VK2KSY	*16.09.85*	
FT708R	1H010948	VK2PJ	*20.04.85*	Call sign engraved
FT757GX	3N040371	VK2DBB	*28.04.86*	Call sign engraved
FT780R	1J061616	VK3ZBI	*00.10.85*	
FT780R	3F070521	VK2XJC	*15.05.85*	
Y-901-P	9L030072	VK1ZVR	*15.12.84*	Includes modules
YP150	81090469	VK2DCB	*16.08.84*	
MISCELLANEOUS				
Dick Smith Audio Generator		VK2XJC	*15.05.85*	
DSE Explorer 70 cm FM Tcvr		VK2KUR	*24.09.84*	Extensive mods
Drake SPR4	3089	VK4ZSH	*03.09.85*	Incl 100 kHz cal
Dressler EVV2000 2m pre amp	1027	VK2XJC	*15.05.85*	
Kyouto FM144-10 2m FM Tcvr	5027	VK2KUR	*24.09.84*	Call sign engraved
Leader LSG-16 Signal Generator	1081098	VK3YSG	*01.01.84*	Misc bits also
Mirage B1016 2m 160W Power Amp	550779	VK3KAW	*23.12.85*	
Regency HX2000 Hand-Held		DSE Vic	*13.05.85*	
Saiko SC7000 Scanner		VK2XJC	*15.05.85*	BNC ant socket
Thorn B&W TV	107512	VK2XJC	*15.05.85*	Mod for computer
Tokyo HL160V 2m Power Amp	829331	VK2XJC	*15.05.85*	
Tokyo HL86V 6m Power Amp	819595	VK2XJC	*15.05.85*	
Tokyo HL90U 70 cm Power Amp	8304246	VK2XJC	*15.05.85*	
Trio CS-1560A2 CRO	10-20171	VK3YSG	*01.01.84*	
Uniden 2020	50806009	VK2KSY	*16.09.85*	
Welz SP200 SWR/PWR Meter	600384	VK2XJC	*15.05.85*	

The above list represents the best information available to the Federal Office of the Wireless Institute of Australia at the time of going to press, errors and omissions excepted.

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RADIODES

ANT IS DIPOLE

Some have dipoles, some have quads,
Some have lengths of wire.
But whether tubes or wires or rods,
It's good to put them higher.

Antenna towers are rather scarce,
Materials are expensive,
So propagating Megahertz
Makes amateurs quite pensive.

A natural solution
Was one that came to me,
By thoughtful evolution
Whilst looking at a tree.

Removing all the branches
From apex down to bole,
Without expending riches
Produced a lengthy pole.

The tree was then equipped with guys.
'Twas rigid then though thin.
Another tree processed likewise
Produced a perfect twin.

A simple dipole in the air
The passer-by now sees.
Because I have a perfect pair
Of half-wave garden trees.

—"Hambard" (Originally printed in the Nigerian ARS Newsletter 1970s)

DEADLINE

All copy for inclusion in the **May 1987** issue of *Amateur Radio,* including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162,** at the latest, by **9 am, March 18, 1987.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable
Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220mm SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — NSW

AMATEUR (VK2JGR ex-L50072): looking for QTH to share with single or family. Must have access to trains to Milsons Point. Clean living, can cook. Present QTH restricts QRV HF. Have own gear. Inquiries L50072, QTHR. HELP?

LARGE CERAMIC ROTARY SWITCH: for ATU of approx 6 positions. Allan VK2EFM, PO Box J221, Coffs Harbour Jetty, NSW. 2451. Ph:(066) 53 2463.

MEMORY UNIT: required for Yaesu FRG-7700. VK2QC, QTHR. Ph:(044) 76 7927.

NEW CHUM: needs to purchase air-variable capacitors suitable for ATUs. Alf VK2NXK/VK2API. Ph:(044) 71 1381.

RF SIGNAL GENERATOR: audio oscillator, with manuals. Laurie VK2AQW, QTHR. Ph:(02) 969 2160.

XITEX SCT-100 RTTY BOARD: at reasonable price. Paul VK2AHB. Ph:(02) 240 4163 BH or (02) 449 9212 AH.

WANTED — VIC

CIRCUIT DETAILS: for Marconi CR100 Rx, and any further information. Will pay costs, etc. Bryan VK3BNO. Ph:(03) 817 1204.

CIRCUIT DIAGRAM: of Palec Valve & circuit tester, Model VCT- 2. Will pay photocopy costs, postage. VK3RN, QTHR. Ph:(03) 551 5639.

COIL FORMER: one air cored, 12 mm by 30 mm. As needed for SW/RXer ETI-718 published in the Radio Experimenters Handbook, Volume 1. Also the planetary drive for aforementioned kit with 5 to 1 reduction. Ph:(058) 21 0846.

COLLINS S-LINE: or KWM2 equipment & associated items. Original condition only. VK3BFB. Ph:(03) 587 1593.

COMMUNICATIONS RECEIVER: General coverage up to 30 MHz. Prefer older type with valves or transistors such as Eddystone model EC10 or earlier. Tony VK3ZMP, QTHR. Ph:(03) 700 5447.

TO GIVE AWAY: large collection of QST, 73 & AR magazines from 50s, 60s. Kevin VK3CV, QTHR. Ph:(03) 882 6431.

METAL FILING CABINET: 2 drawer. Old wireless sets & parts. Don't dump them, donate them to the Geelong Radio & Electronics Society Museum. Genuine collection. Contact Bill VK3BWS, QTHR. Ph:(052) 9 3337

VEHICULAR CONTROL UNIT: Type 1P59653 or Type P59653, for AWA MR-10C. Must be in good condition. J Nairn, PO Box 443, Leongatha, Vic. 3953.

WANTED — QLD

EARLY WIRE & WIRELESS TELEGRAPHY EQUIPMENT: Also copy of 73 Wire and Dipole Ant. Contact Fred VK4NMA, QTHR. Ph:(07) 396 3521.

TS120/130: or fully transistorised transceiver for pensioner. VK4MAP, QTHR. Ph:(071) 72 8107 reverse charge okay.

WANTED — SA

OPERATING INSTRUCTIONS: circuits, any information at all for Marconi "Test Set Deviation FM No 2, ZD00193." This is a valve unit, circa 1959, with frequency range of 2.5 MHz to 100 MHz. Ivan VK5QV, QTHR. Ph:(087) 25 5514.

FOR SALE — ACT

PORTABLE COMPUTER: Tandy Model 100. 32 kB internal RAM. Built–in communications, word processing & database ROM software. Perfect for portable Packet Radio terminal. $500 ONO. Portable disk drive for Tandy Model 100, 102 or 200 computers. Battery powered. 3.5" discs. With spreadsheet, database, word processing & AR software on discs. $200 or both for $650. Contact Ray VK1ZJR, QTHR. Ph:(062) 88 0027 AH.

100 WATTS: 430-440 MHz Amplifier. GaAsFET Dreamplifier Corona HP 12OUDX. $550. 6m transceiver, Icom IC-501, 10W SSB $250. AM & CW 50-54 MHz. Ralph VK1RK, QTHR. Ph:(062) 81 0203 AH.

FOR SALE — NSW

MICROWAVE MODULES: 2m/70cm transverter, ideal for use with Yaesu FT-290R or similar radio. $200. IBM PC with RTTY software & many options including expansion interface, price negotiable around $3000. AEM direct connect modem 1200/75 & 300 Baud. $100. Telefunken (JVC) Video porta- pack with lots of accessories. $1400 ONO. VK2HL. Ph:(02) 981 4762.

TELETYPES: two M15. 2 Tape dist, Model 14. 1 Tape Reperf Model 14. 110V Transformer, plus manuals. $110 the lot. VK2KGZ. Ph:(046) 77 2425.

VIBROPLEX CHROME DELUXE BUG: $70. Transformer 2500V a side, 800 mA plus matching auto transformer 1.6 kVA. Taps 110, 150, 190, 230V. $200. Will not separate. Eimac 4CX1500B. New in vacuum pack. $300. (New price $1100). Used Eimac 4CX1500B. 2 for $100. All plus postage. Allan VK2AGR, QTHR. Ph:(044) 71 1059.

FOR SALE — VIC

DECEASED ESTATE: Philips PM3260 port oscilloscope. Dual trace, 120 MHz, 2 sets of probes, PM9351L, operating manual. As new, orig price $2163, will take $1650 ONO. VK3BWS, QTHR. Ph:(052) 9 3337. Ask for Bill.

GENUINE ARMY LUCAS LAMP: or Helio stand A Mark 2 with 1' extension. VGC. $55 ONO. VK3BWS, QTHR. Ph:(052) 9 3337.

SX155 SCANNER: with charger. As new $350. FT-209R, 2m transceiver with charger. Excellent condition. $280. FT-7 transceiver, never been mobile. As new condition. $500. Stan. Ph:(03) 743 6708.

YAESU FRG7 COMMUNICATIONS RECEIVER: in mint condition. Factory fitted fine tune control. No mods. 0.5-29.9 MHz. $250. Yaesu FRV7700B VHF converter. 50-60 MHz, 118-130 MHz, 140-150 MHz. IF freq 18-30 MHz. $100. Bob L30174, QTHR. Ph:(03) 758 6768 AH.

YAESU FT-7: mobile HF transceiver. Covers 80, 40, 20, 15 & 10m (28.0-29.0) bands. Complete with manual & mobile bracket. This unit runs 20W DC input & would be ideal for novice operator. $325 or best offer. Ph:(03) 374 1389.

70 cm ALL-MODE: IC-451A with Icom low noise preamp in excellent condition. 110V/12V power supply. Best offer. Commodore 64 cartridge MAP64-2 tx & rx RTTY, CW, AMTOR & ASCII all included. Ready to run on Icom rig. $300. Andy VK3DTO. Ph:(053) 48 3003.

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ISOLATING TRANSFORMER: (National) 240V to 100 V. 15A continuous 1500 kVA rating. Weight 26 kg. $100 + freight. Andrew VK7ZHA, QTHR. Ph:(004) 24 3780.

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PACKET RADIO: AEA PK-80 TNC. Standard terminal RS-232 interfacing TNC. TAPR TNC-II board. Like new. Original packing & manuals. $425 post paid. Rick VK8RP. Ph:(089) 52 2730 Alice Springs.

Advertiser's Index

ATN ANTENNAS ..... 19 & 39
AUSTRALIAN ELECTRONICS MONTHLY . 34
BAIL ELECTRONIC SERVICES 60
DICK SMITH ELECTRONICS ..... IFC
ELECTRONICS TODAY INTERNATIONAL ..... 13 & 55
EMTRONICS 25
IAN J TRUSCOTT'S ELECTRONIC WORLD ... 60
ICOM AUSTRALIA PTY LTD ..... BC
KENWOOD ELECTRONICS AUSTRALIA PTY LTD ..... IBC
LOCUS TECHNICAL 18
TEGA ELECTRONICS 21
VICSAT 29
WIA MAGPUBS ..... 29 & 53
WIA (NSW DIVISION) NOVICE LICENCE .. 21
WILLIAM WILLIS & CO PTY LTD 28

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  USB, LSB, CW, AM, FM, and AFSK. Mode selection is verified in Morse Code.
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  Covers 80-10 meters.
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- **Dual SSB IF filtering**
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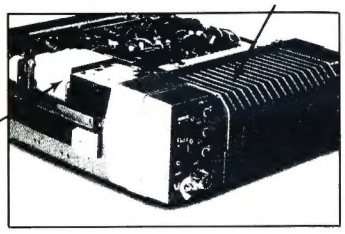

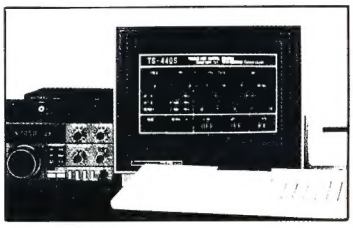

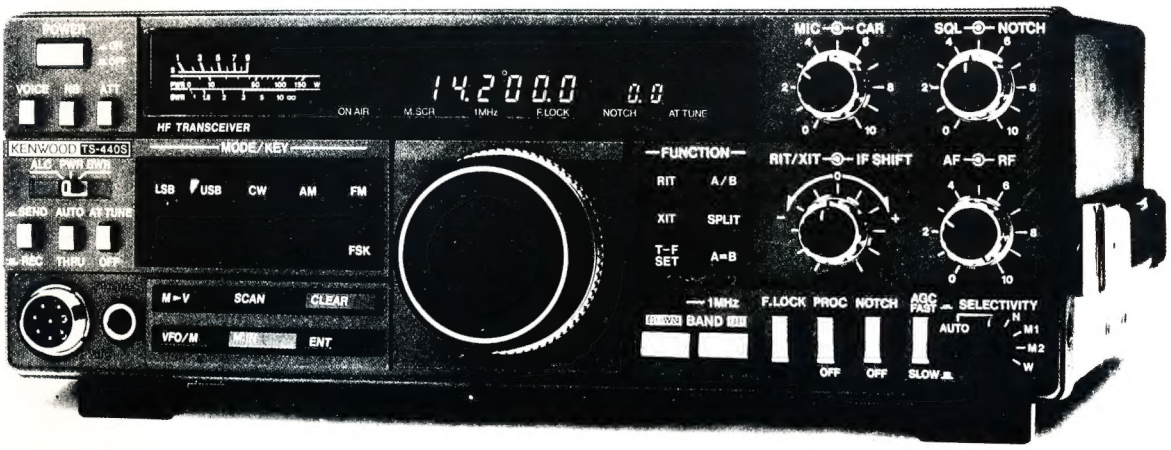

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